INDUSTRIAL MEDICINE

The Journal of Occupational Diseases
and Traumatic Surgery

March, 1941

Rehabilitation
— at the Baton Rouge Refinery —

Electric Shock, Electric Burns
— and Their Treatment —

Chronic Arthritis
— and Re-employment —

Gastric Pathology
— Recent Developments —

Industrial Medical Practice
— Its Special Nature —

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Volume 10 Number 3

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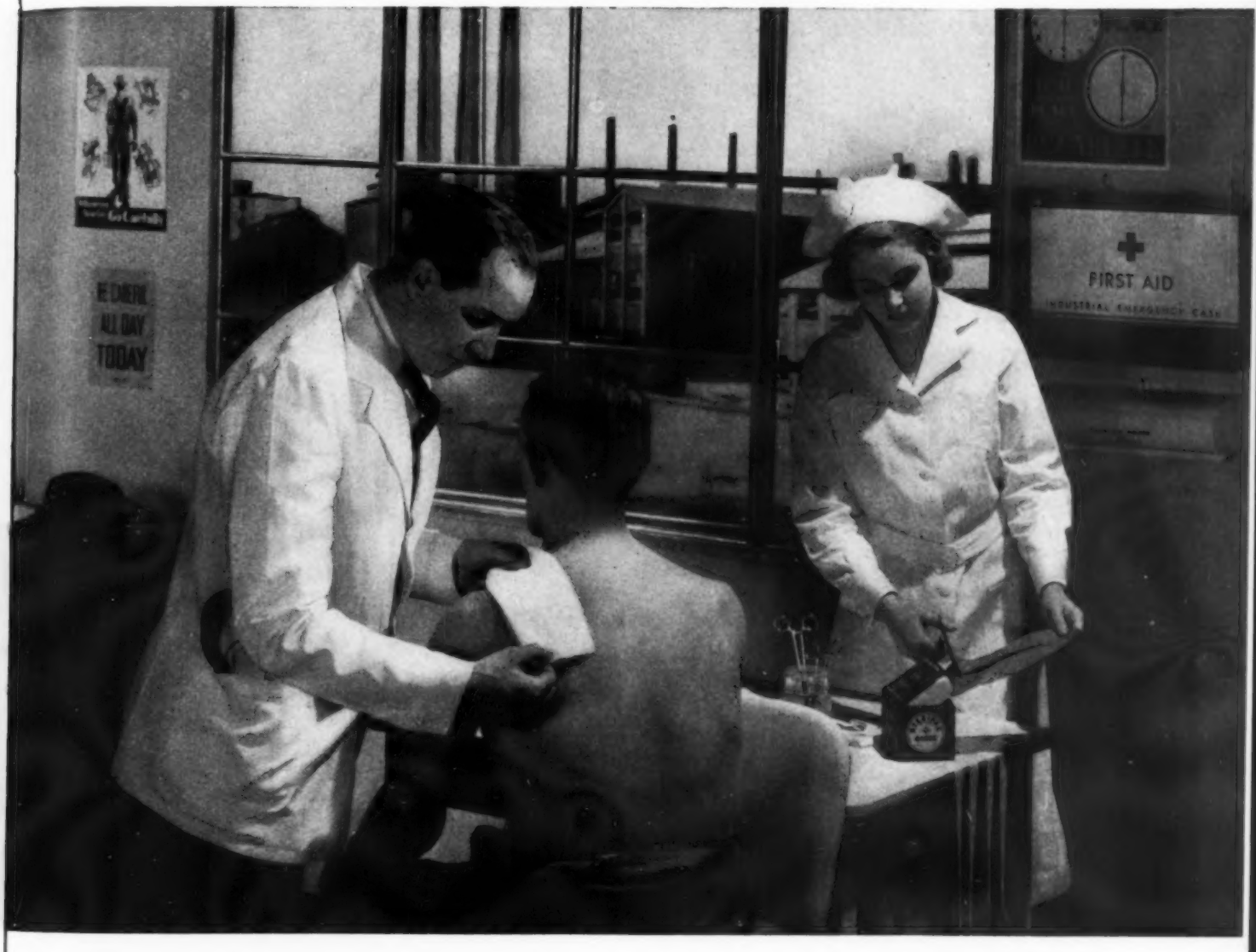

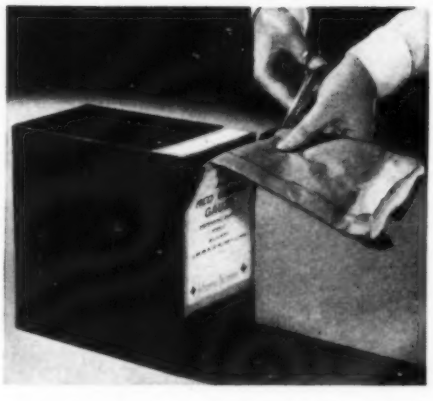

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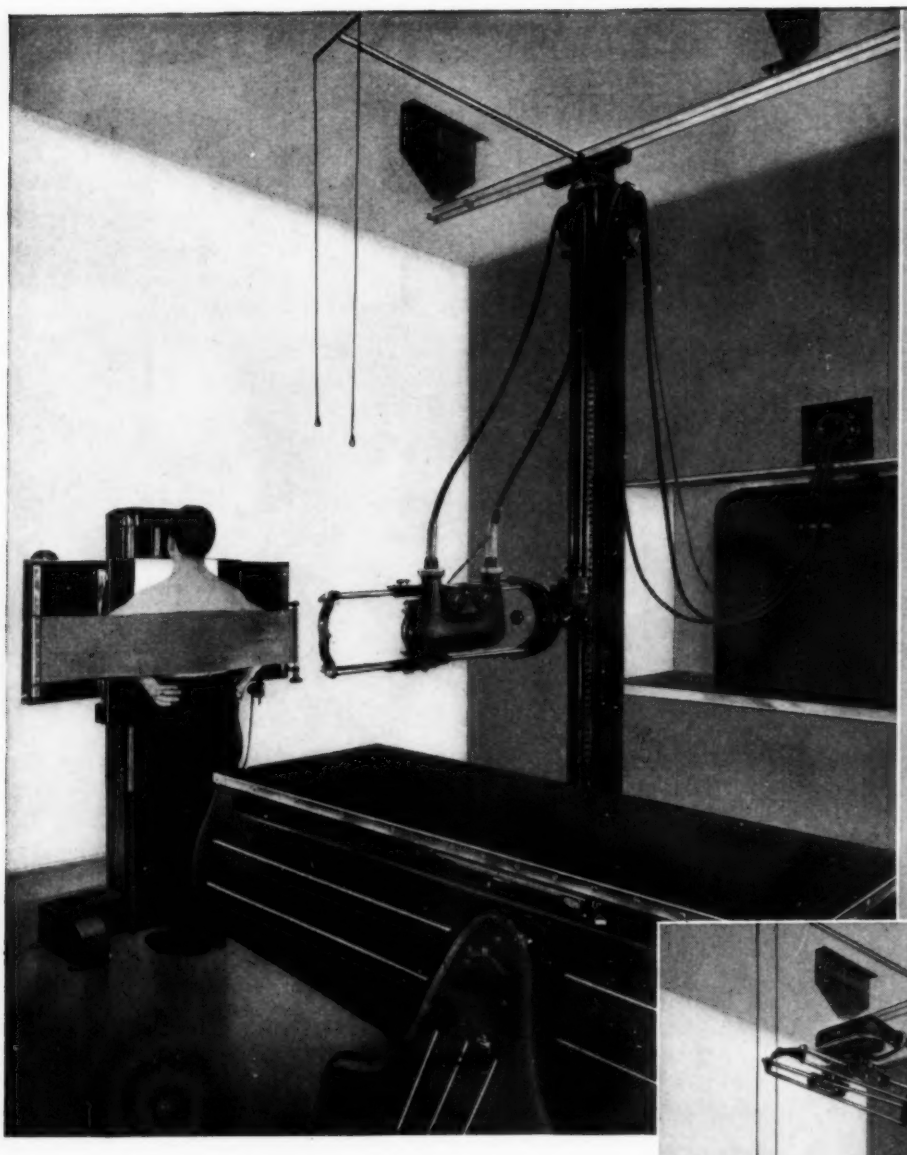

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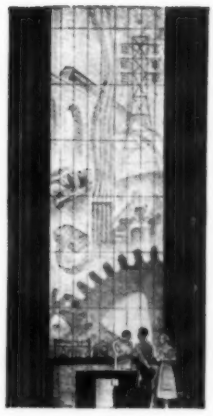

OCCUPATIONAL DISEASES
TRAUMATIC, INDUSTRIAL

INDUSTRIAL MEDICINE
& RAILROAD SURGERY

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DRS. GEORGE and ALLEN prepared their analysis on "Rehabilitation at Baton Rouge Refinery" for their company's *Medical Bulletin*, where it was so well received as to suggest its publication here — where every element of its excellence may be of maximum availability to the many who are interested in the subject. There is a whole philosophy of rehabilitation in the authors' statement that "a cripple is not a 'cripple' during the period he is at that work the performance of which is not affected by his handicap or disability." And convincing proof of the soundness of that philosophy is found in their conclusion that "disabled employees frequently make the best employees." DR. GORDIN'S "Electric Shock and Electric Burns" (page 87) was read at a meeting of the Mississippi Section of the American College of Surgeons, at Gulfport, on January 31, where, again, the outspoken interest of the smaller initial group of hearers suggested subsequent availability to the larger group of readers. The modern trend toward the widespread prevalence of electricity throughout the country involves, necessarily, the "decentralization of electric burns and shock from the large cities and industries" to the respective bailiwicks of "the local physicians in every community." The author's bibliography indicates the thoroughness of preparation which assures his article, based as it is on personal knowledge and experience, the status of an important addition to the literature of the subject at

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—*Continued from Page 3.*

a time when such additions are needed. Dr. Ivy's "Gastric Physiology" (page 91) is his own summary of the report on recent developments which he presented at the Fifty-First Annual Meeting of the American Association of Railway Surgeons last September. For those who believe in the inevitability of progress where research is in competent hands and under authoritative direction — and who doesn't? — there is a definite uplift in his concluding paragraph (page 93). Dr. Barker's "Hypertension" (page 93), also from the Railway Surgeons' meeting, is another of those experience reports which, because of limitations on the time of delivery, are hard-packed with the burgeoning stimuli of thought that make reading a pleasure. Dr. Kuhns' "Chronic Arthritis and Re-employment" (page 94) is one of the most important studies it has even been our privilege to publish. The full classification of disability listed in the report of Dr. Lynch's A. A. I. P. & S. Committee on the Employability of the Handicapped (see Industrial Medicine for September, 1940, page 441) does not include crippling from this cause, although a shorter classification (Table II of the report) probably recognizes it under "miscellaneous." In general it has been given only minor and cursory consideration. But, as Dr. Kuhns remarks, it is a vital matter to all concerned — to the patient himself it is "major" in utmost degree, and

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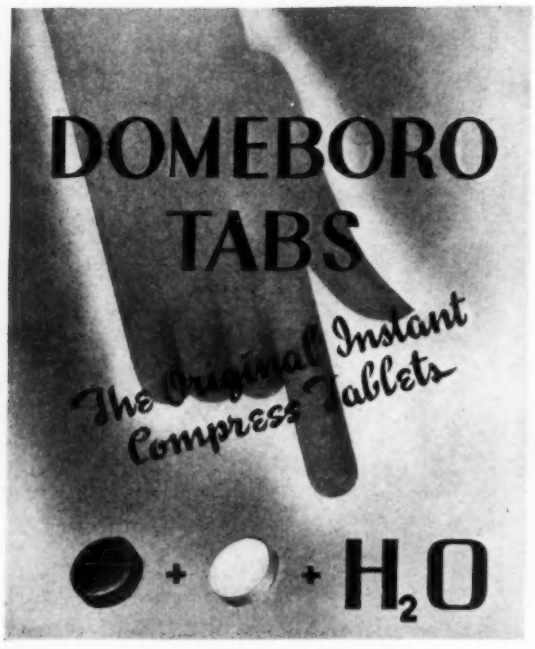
—Continued from Page 6.

to the employer and the physician it is an insistent factor of the problem of rehabilitation as it presents itself to them. A start had to be made toward its major recognition, and DR. KUHNS has made it. The series available, as he says, is relatively small. But it has been carefully studied, and the results and conclusions are soundly summarized and masterfully given. They are heartening: "it would appear that only about one-fourth of chronic arthritics do not become re-employable in some capacity due solely to the severity of their arthritic condition." The author closes with the acknowledgement that "much more detailed and carefully collected data over a longer period of time are necessary for the successful elucidation of the many faceted problem of re-employment and chronic arthritis." This is true, of course, as to this problem — just as it is true as to numerous others. But not many problems as new as this get off to better initial impetus. This presentation is not only a suberb basis for, but it is also, and emphatically, a fine inspiration to, the further study that must eventually culminate in "successful elucidation." DR. GLAZEBROOK's "The Common Cold" (page 99) comes at the time of maximum interest in its subject. The abstract (page 112) of DR. LANZA's report on "Incidence and Costs of Acute Respiratory Diseases in Industry" at the Third Annual Congress on Industrial Health, at Chicago, in January, says: "The

—Continued on Page 8.



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—*Continued from Page 7.*

best information gives the time lost from colds as averaging one day per year per person, male and female. This means 25 million days a year . . . involving a burden of waste man years for colds of nearly a billion dollars." DR. GLAZEBROOK'S comments are exceedingly interesting, those on preventive vaccines, predicated on his unusual opportunities for observation of their effects, being particularly timely. DR. SAPPINGTON'S study of "The Special Nature of Industrial Practice" (page 101) confirms what those who are in that kind of practice have long known, and emphasizes what those who are not in it have long needed, and now need more than ever, to know. It should be read and studied by every practitioner whose work even so much as touches upon the employment status of any patient — for it is more than ever true, and will be increasingly true under the accelerated tempo of the superimposed defense program, that "good medicine is not necessarily good in-

—*Continued on Page 9.*

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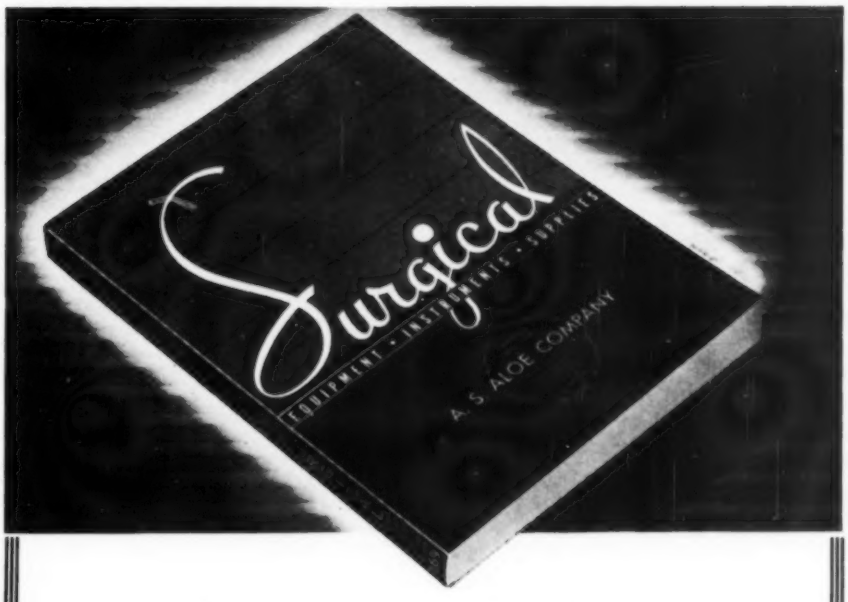

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—Continued from Page 8.

dustrial medicine. One must be something besides a good doctor to be a competent industrial physician." DR. MILLER'S "Dental Program in Industry" (page 104) leads up to a conclusion in which a growing number of physicians *and* employers are becoming very much interested: that "it is within the bounds of propriety for any industry to make available to its employees dentistry of the highest character at the lowest possible cost." The Doctor adds: "under a plan such as I have described," and we add: "very excellently and interestingly." THEN follow (pages 106-115) the abstracts of the papers and talks given at the Third Annual A.M.A. Congress on Industrial Health, at the Palmer House, Chicago, January 13, 14, and 15, 1941. These we commend to our readers without remarks except to say that RUTH HOULTON'S own summary of her paper "The Industrial Nurse," which she read at the opening of the Monday afternoon symposium on the Availability of Trained Industrial Health Personnel, appeared

—Continued on Page 10.

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—*Continued from Page 9.*

in INDUSTRIAL MEDICINE for February, 1941 (page 67).

THE Program of the Pittsburgh meeting in May (page 115) is also commended without remarks. It needs only to be read in order to enlist the response of anticipatory enthusiasm which its magnificence in variety and values cannot fail to deserve. It involves the Twenty-Sixth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS and the Second Annual Meeting of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, at Pittsburgh, Pennsylvania, May 5, 6, 7, 8, and 9, 1941, both together comprising, indeed, a post-graduate "Institute of Industrial Medicine and Industrial Hygiene." MEMBERS of the A. A. I. P. & S. and its Component Societies (now 12 in number) will be interested in the proposed Constitution and By-Law amendments (page 117) to be voted on at the Annual Meeting. THE outline of "Industrial Hygiene Problems in the National Defense Program" by DR. C. D. SELBY (page 118) is in the nature of a "General Statement." It was

—*Continued on Page 130.*

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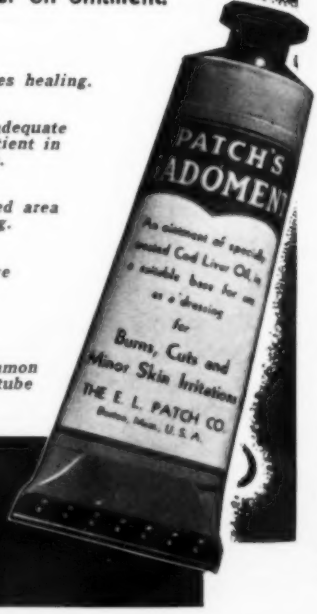

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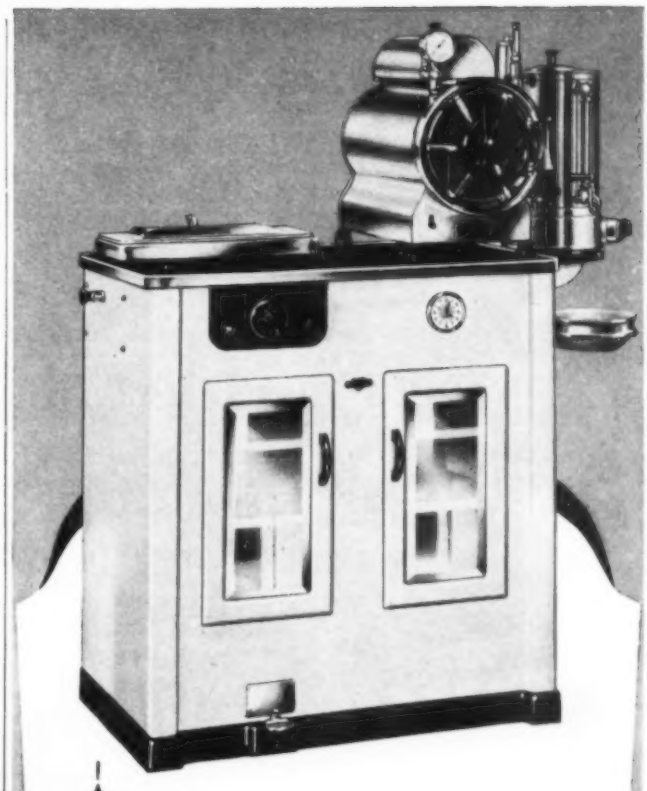

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This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

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The editors will exercise care in checking on the accuracy of data printed, but in all other respects articles and opinions of which expression is allowed are the opinions of their authors—the editors reserving in all cases the right to comment on the same, in the current or any subsequent issues, as they may be inclined.

The Journal of Occupational Diseases and Traumatic Surgery

With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 10 MARCH, 1941 Number 3

Rehabilitation at Baton Rouge Refinery

I. L. George, M.D., *and* Chas. E. Allen, Jr., M.D.
Standard Oil Company of Louisiana,
Refinery Medical Department,
Baton Rouge, Louisiana

DURING and following the World War, it became apparent that there was a large number of disabled and maimed men who needed physical and mental reconstruction and rehabilitation in order that they might return to society as independent social and economic units. The war taught that a great deal could be done to fit a disabled man to work at a remunerative occupation.

The business of helping the injured or diseased cripple to help himself is modern. In early times the cripple was believed to be the object of divine displeasure and was allowed to die of neglect or even put out of the way as a nuisance. Even in present times many of these unfortunates find it necessary to live by begging, and in some instances are even exploited and forced to beg by unprincipled relatives or employers.

Today a situation similar to that following the great World War exists in civil life. Many individuals become disabled from illness or accident while in the employment of the various industries throughout the country. To meet this situation many industries have established comprehensive systems of industrial medicine and surgery which actually practices the best forms of reconstruction of disabled men although the work may not be so designated.

The picture of disability in industry today is probably somewhat different from that presented by the great war. Industry has established extensive safety programs and as a result, the maiming of workmen has been reduced to a minimum. In view of this reduction, it is questionable if the terms "physical reconstruction and rehabilitation" as applied to the effects of the war medical staffs would clearly define the scope of the efforts of the medical staffs in industry. Sickness educational programs, however, have not kept pace with safety educational programs, and as a result, many problems present themselves in the form of the chronically ill. Therefore, it is the impression that the terms "conservation and reclamation" of employees might express more definitely the aim and accomplishments of industrial medical staffs. The term "conservation" would apply to the part of this type of program devised to keep partially disabled men on the job and to conserve their working ability as long as possible, while the term "reclamation" might be applied to the portion of the program devised to return employees to the job who have gotten beyond the stage of conservation and have of necessity had to lose time from work. Under the industrial setup, the reclamation or rehabilitation of the employees actually takes place on the job instead of by some form of vocational training prior to returning them to a remunerative occupation. The conservation and reclamation of physically handicapped individuals is directed at assisting nature in her efforts to make functional adaptation as perfect as possible. It aims at making the disabled person a good wage-earner and an occupation is chosen for which the disability is the least handicap, for a cripple is not a "cripple" during the period he is at that work the performance of which is not affected by his handicap or disability. For example, a married man, the needs of whose family compel him to resume work before he is completely cured, is speeding up the cure and functional adaptation. National or company economy is not served by paying compensation and leaving a potential producer of this type without any outlet for the capacity he still possesses. Light work with wages is the best method of overcoming the lethargic condition of mind and muscles produced by a long illness; it restores self-confidence and displaces dejection. This procedure of placing an employee

at work prior to his becoming 100% physically capable works to the advantage of both the wage-earner and the company. There is hardly an employee in the Refinery who, after a prolonged illness, does not begin to wonder and worry about whether he still has his job at the Refinery. Many feel that the Refinery might be able to run without them; and when a man gets in this frame of mind, some form of light work, if he cannot resume his usual occupation, improves both his mental and physical conditions. If an employee draws full-time sickness benefits, this represents 100% loss to the company; and if he is returned to the job when only 25% efficient, this represents an economy of 25% of his salary. In other words, the disabled must be reclaimed and conserved for industry in their own interests and in the interest of national and company economy.

Plan of Medical Service

THE desired results in a conservation and reclamation program for employees must be founded on a well rounded plan of medical service. At the Baton Rouge Refinery this plan includes the following:

1. Careful selection of new employees.
2. Prevention of disease and accidents.
3. Constant health supervision.
4. Adequate medical and surgical care of all disabled.
5. Sufficient compensation for the disabled man and his dependents to live on while he is undergoing reclamation.
6. Practical training in the plant for all employees, including the man who is prevented from returning to his old job because of disability.
7. Proper selection of work according to the physical and mental qualifications of each individual, including properly chosen work for the handicapped man upon recovery.

All the points mentioned in the above plan are carried out in an excellent manner at the Baton Rouge Refinery with a possible exception of the seventh or last point. This deals with conservation and reclamation of employees.

The conservation and reclamation of employees from illness and accident has been practiced at Baton Rouge from the beginning of the medical department. In the past few years a systematic check on this particular branch of employee welfare has not been in use, consequently many men were placed on light work and meant to be left there only temporarily. However, due to lack of records and recall dates for examination, the men have been lost sight of; many have probably worked in light duty jobs much longer than necessary, when they actually would have liked to have had a better job and were capable of filling it. In this instance both the company and the individual lose. There is another instance in which an employee is physically unable to hold his present job, but continues to hang on to it with deleterious effects to his health. Still another instance is the occasional individual who wishes to get on light duty and stay there because of lack of ambition. Realizing that the medical department could assist the management and the employees in better placement, it was felt that a proper filing system should be instituted for this group of handicapped men. In September, 1939, this filing system was started and it now represents a perpetual inventory of the handicapped employees in the Refinery, showing the percentage of disability the employee has for his original job, the percentage of disability he has, if any, for the job he is doing at present, and indicating when he should be rechecked from a medical standpoint to ascertain whether he is properly placed in a job or whether his status should be changed. This survey, or perpetual inventory, of the handicapped personnel has been in progress now approximately eight months, and it is felt that there are probably only a few individuals who have not come under our surveillance. By keeping this inventory, the medical department will be able to ascertain at a moment's notice just what portion or percentage of the so-called "burden" the disabled employees make up.

Before going into the interesting facts revealed by this perpetual inventory, it will be well to discuss just how the medical department goes about finding a job for the handicapped. The general principles in the placing of these employees in remunerative employment recognizes:

1. The importance of a thorough physical and mental examination prior to placement;
2. A determination of the individual's work capacity;
3. His limitation being ascertained by a decision as to whether the job requirements exceed the individual's capacities.

It can be seen that the last principle necessitates a rather intimate knowledge of the various job requirements on the part of the medical department.

A thorough physical and mental examination prior to placement is most essential, as it points out the possible weakness or exaggeration in the person's own mind concerning his ability or inability to perform certain jobs. Very often that individual is compelled to lead a life of invalidism or enter a vocation far below his physical or mental capacities, and hence often less remunerative.

One of the most perplexing questions the medical department has to consider concerning any person who has suffered from a serious disabling accident or disease is: What are the limitations produced in the person by this experience? The limitations may be both physical and mental; a person who has had a serious disabling accident has sustained a severe shock, he has had a period of convalescence during which he has been a prey to many doubts and fears. What effect all this may have had physically is not well known, but pathological impressions on the central nervous system do remain, which frequently manifest themselves in a change in the patient's attitude towards life and his ability to tackle its problems.

The mental attitude is highly important; many patients come through nerve-wracking experiences apparently with increased will-power, determination and ambition. Sometimes they attempt too much and too vigorous a work; they need

restraint. On the other hand, there are many who come through with weakened wills, weakened determination and chronic discouragement instead of ambition. Emotional instability is not an uncommon manifestation among persons with more sensitive dispositions.

The next important step in rehabilitation is the placement of the individual in accordance with his ability. Of all the jobs in the Refinery opened to one-armed men, it is possible that the guard department offers the most opportunity. The cripple who is hardest to place is the one who uses crutches. Conditions in the Refinery prevent the employment of men with crutches, yet it is possible to find places for men with artificial legs.

There are two types of cardiac — those who want to do too much and those who do not want to do enough. A potential cardiac may do fairly heavy work except not too much stair climbing or lifting. Office jobs are not satisfactory for these men if there is much running on errands. We have been able to place severe head and back injuries, some on process and others in light jobs in the mechanical department. There are many persons who would be able to do light work and failing to get it endeavor to make their disabilities last as long as possible so as to draw their benefit allowances.

An examination of the perpetual inventory of the Refinery personnel having some disability as of April 1, 1940, gives some interesting information.

There are at this time 122 employees, or approximately 2.8% of the entire personnel, coming under either the conservation or reclamation program. In the conservation program these employees are being given some consideration in the way of light duty, change of occupation or working on their jobs with slight reduction of physical efficiency.

An analysis of this group shows these employees to be in the following divisions:

	White	Colored	Total
Mechanical	44	30	74
Process	13	8	21
Co-ordination	17	3	20
Technical	2	5	7
TOTAL	76	46	122

In the conservation program, that is the placing of employees with varying degrees of disabilities either from injury or illness in jobs to best conserve their health, the inventory reveals that 71 employees must be shown some consideration due to disability from illness not attributable to their jobs. Of this group 30 are white and 41 are colored. It can readily be seen that in this group in which disability is due to illness, it is necessary to favor the colored employees in many more instances than it is to favor the white employees. In fact, the white employees constitute less than 1% of the entire white personnel, while the colored employees form about 5% of the entire colored personnel. This group of 71 employees is found in the following divisions:

	White	Colored	Total
Mechanical	21	27	48
Process	4	6	10
Co-ordination	5	3	8
Technical		5	5

Collectively, this group of 71 employees was 70% disabled for their original jobs, and in 39 instances it has been found necessary to find new and lighter jobs and transfer these men away from their original occupations. By placing these employees in jobs according to estimates of their physical disabilities prepared by the medical department, it is found that in their new jobs these 71 employees are only 14% physically disabled.

Also coming under the conservation program are 30 employees who have suffered permanent and partial disability due to industrial accidents. Of this group 27 are white and three are colored. These employees are in the following divisions:

	White	Colored	Total
Mechanical	17	2	19
Process	1	1	2
Co-ordination	9	0	9
Technical			

Collectively, this group of 30 individuals was 75% physically disabled for their original jobs, and in 20 instances it was necessary to transfer these men away from their former occupations to new and lighter jobs. By placing these employees in jobs according to their physical disabilities as estimated by the medical department, these 30 employees are now only 12% physically disabled, or in other words they are now 88% physically efficient as placed.

By combining the above statistics of employees who have to be shown some consideration in their work due to illness and industrial accidents, it is found that 101 employees may be considered as coming under the health conservation program.

In the portion of the employee welfare program, which has been designated in this paper as "reclamation," will be found those employees who are at present on the sick report and losing time over 60 days. Most of these individuals will require some time as yet in which to try to reclaim their health before returning to work. Following their eventual return, they would then be considered as coming under the health conservation program until such time as they are, or may become, capable of being classified as 100% physically efficient. At this time it is found that 20 employees are off from work due to chronic ailments and one employee is off due to a disabling injury. Naturally while on the sick or accident report they are considered as 100% physicially or mentally disabled for any type of work. In this group there are 19 white employees and two colored employees, as follows:

	White	Colored	Total
Mechanical	6	1	7
Process	8	1	9
Co-ordination	3		3
Technical	2		2

The next point of interest is: What are the diseases and accidents responsible for these employees being given such consideration? As mentioned before, 71 employees under the conservation program are receiving consideration in their work because of disability due to illness not attributable to their jobs. The following table shows a classification of the causes of disability in this group:

White:		
Cardiovascular:		
Hypertension	5	
Heart disease	4	
Heart disease (syphilitic)	1	
Arteriosclerosis	1	
	—	11
Arthritis		5
Healed tuberculosis		3
Eye		2
Nerve disorder		2
Loss of member		1
Alcoholism		1
Paresis		1
Mental disorders		1
Fracture		1
Chronic bronchitis		1
Hernia		1
TOTAL		30
Colored:		
Syphilis:		
Cardiovascular	19	
Generalized	4	
Cerebral spinal	1	
Syphilis and loss of eye	1	
	—	25
Eyes		3
Hypertension		3
Fibrosis of lung		3
Heart		2
Epilepsy		2
Hernia		1
Chronic nephritis and obesity		1
Prostatitis and cystitis		1
TOTAL		41

The diseases that make it necessary to give white employees consideration in their work conform fairly closely to the causes of death throughout the nation, namely, heart disease, tuberculosis, et cetera. In the case of the colored employees, syphilis is by far the outstanding offender and causes over 60% of disability due to illness under the health conservation program. This finding is in accord with the facts that: (1) Syphilis is the outstanding cause of rejection of colored applicants; (2) approximately one-fourth to one-third of the Refinery colored personnel have syphilis in one form or another.

Also under the conservation program it is found necessary to favor 30 individuals due to industrial accidents. Of the 27 white employees, the causes of disability are as follows:

Fractures	12
Loss of one eye	7
Loss of a part (arm or leg)	3
Concussion	2
Back injury	1
Amputation of a finger	1
Abdominal strain	1
TOTAL	27

In the case of the three colored employees, disability is caused by blindness in one eye in two cases and a fractured femur in one case.

In the reclamation program 21 individuals are found, 19 of whom are white and two are colored. The causes of disability of the 19 white employees are as follows:

Heart disease	6
Mental disorder	3
Eye conditions	3
Pulmonary tuberculosis	2
Splenomegaly (Banti's disease)	1
Polycythemia Vera	1
Cerebral hemorrhage	1
Ulcer on the right foot, undetermined origin	1
Fracture of femur	1
TOTAL	19

The two colored employees are off on account of pulmonary tuberculosis in one case and a double inguinal herniaplasty in the other.

From the above table it can be seen that heart disease is the most common cause of chronic illness as well as the most common condition that makes it necessary to give white employees consideration after they return to work.

Several years ago an excellent start was made in the conservation of sick and injured employees by the establishment of a department wherein they could do useful work and yet not have to be extended beyond their physical and mental capabilities. This department is known as the salvage and reclamation department which reclaims used materials; and while it was established to find a place for the handicapped employee to work, ironically enough it is reputed to be a money-making department in the Refinery.

During the past five years the salvage and reclamation department personnel has remained more or less constant due to the saturation of this department with individuals for whom there is no hope of returning to a remunerative occupation in the Refinery proper. In view of this fact, it has now become slightly more difficult to follow our program of conservation of employees' health and has become necessary for each department to care for its disabled in so far as it is capable.

There are two outstanding obstacles to a program of this type, namely, inflexibility of transfer rules and the inability to maintain an employee's earnings at a constant level when he is transferred from one job to another. Were there no obstacles a Utopian situation would exist; however, the company has been able to maintain a satisfactory conservation and reclamation program regardless of these conditions.

Skill in surgery and ingenious mechanical appliances can do much to convert a cripple into a useful operator, but justice would not be done to the subjects of conservation and reclamation or to the disabled if attention were not drawn to the latent possibilities of fitting the work to the worker. In fact, the problem of making the "holes" of occupation round for the "capacity-pegs" of the workers to fit into applies doubly to the disabled. Where the will to do this exists, frequently remarkable results can be obtained.

The reasons for favoring the disabled employee are purely business reasons and can be stated as follows:

1. Reduces labor turnover. These men hesitate to change jobs more than do the able-bodied.
2. Makes them loyal employees. They appreciate the opportunity given them to work in a world that would otherwise confine them to the scrap heap.
3. Are more punctual and have less absenteeism. As a rule, they take a more serious view of life, do not use alcohol, stay home of nights, and avoid experiences that lead to sickness.
4. Take pride in their accomplishments. The reaction from those days when they thought they were cripples makes them strive the harder to make good.

Practically every state in the union has assumed the task with Federal help of providing vocational education and other assistance for those who need help in adjusting themselves in industry because of disabilities arising from injuries or disease. Fortunately, movements and efforts are made within the Refinery along these lines, and it is the hope that by means of this study we will be able to give impetus to this type program to continue proper placement of handicapped employees, and that it will not be necessary for the state to assist in taking care of the company's disabled. With proper aid from the company, hope takes the place of despair in the handicapped, and each finds confidence in his ability to compete with other employees, which prepares him for the next step, where he will be expected to hold his own without asking for any special consideration because of his disability.

Conclusions:

A CONSERVATION and reclamation program for employees in industry is a definite entity and is really part and parcel of the sickness and accident program. Proper placement of handicapped employees is a factor in any safety program.

2. A definite plan of medical and surgical service in industry is necessary for the carrying on of this type of program.
3. Thorough examination by the medical department is indicated prior to attempting to place handicapped employees in a remunerative occupation.
4. Statistics show that 60% of employees coming under such a program are in the mechanical department.
5. In the case of the white employee, the causes of the disability from illness follow very much in the order of causes of death in the nation, namely, heart disease, tuberculosis, et cetera.
6. Statistics in this paper show that syphilis is the chief offender in causing disability among the colored employees.
7. Fractures are the outstanding causes of disability from industrial accidents.
8. This study indicates that white employees predominate in the group that require consideration due to industrial accidents, while the colored employees predominate in the group requiring consideration due to illness not attributable to their jobs.
9. A perpetual inventory of the disabled personnel should be kept by the Refinery medical department.
10. Disabled employees frequently make the best employees.
11. Practically every state in the union has assumed with Federal help the problem of rehabilitation. The company is able to take care of its own program.

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Electric Shock, Electric Burns

—*and their Treatment*—

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IT IS interesting to note that with the widespread use of electricity and the large number of accidents attributable to electric current there is relatively so little written on this subject. With the great expansion of high-powered electric lines throughout the United States, there will be a decentralization of electric burns and shock from the large cities and industries to a widespread prevalence throughout the country, which will necessarily be treated by the local physicians in every community. So little is written in the textbooks and so little is taught in the schools about this condition. These accidents will become more common not only among the electric workers, but also among the general public. The greater number of these accidents with both the experienced and inexperienced in electricity will be due to negligence or carelessness either on the part of the electric worker or the public. There will, of course, be some accidents which will be unavoidable where carelessness is not involved.

In this paper it is impossible to go into all of the technical considerations involved; however, for practical purposes, it is necessary for us to understand and know some of the inherent general conditions. For practical purposes in our state and in our community we deal principally with circuits in the high-powered wires. We have relatively few accidents in circuits of 110,000 volts because they are usually handled by experts and the circuit is broken by grounds at regular intervals when persons are working on them.

The more frequent accidents come from the circuits of 2300, 4400, 8200 and 13,800 volts. We then, have the lesser circuits of 110, 220, 440, volts. The more frequent severe burns occur in the circuits from 2300 to 13,800 volts. There has been considerable written as to whether alternating or direct current is the more dangerous and severe in

cases of electric shock and burns, but from the general consensus of opinion and from my own experience, I believe there is no difference in severity between these two currents. A great deal has been said about the amperage as a factor in electric burns, but for our practical purposes as physicians, I believe we can forget the amperage and think mainly of the dangers in term of the voltage, although experimentally it has been shown that circuits with high voltage and very low amperage can be passed through the body with little effect. In a relative way, the lower the voltage, the relatively greater the amperage. It seems to me that in the few cases of death which I have seen as probably due to electric shock attributed to low voltage (as, 110 and 220 volts), in each case, there has been a factor where the amperage has been greatly increased and in these conditions the burns are relatively slight, however, the shock severe. It is a question whether or not these low voltages will produce this profound shock and whether some other factors which have increased the voltage are not involved. The duration of contact with the current is important.

There are many conditions which have to do directly or indirectly with the severity of the shock with any voltage. It is well known that if a person is damp or wet, as from perspiration, the shock and burns will probably be more severe. It, also, is noted that where the current travels from one leg to one arm or entirely through the body the chances of death from shock are much more than if the current travels from one arm to the other arm or from one leg to the other leg. It, also, is noted that a patient partially insulated will have less shock than one who is not insulated at all. We impress our employees, and it should be impressed on the public, that should they work with electricity with not only their tools but also their person well insulated. It is better, however, to warn the public the danger of electricity and have them keep away from high voltage as much as possible.

IF A person should come in contact with high voltage, or any electricity, immediate removal of the patient from the contact is most important, and the persons removing such a patient should be warned of the dangers. If the wires are cut or the patient pulled away from the wires, the person doing so should see that he himself is insulated against coming in contact with this patient or with the live electric wires.

The immediate treatment of electric burns or electric shock should be the general treatment of the patient, the burns being forgotten. When a person is severely shocked by electricity, he should be removed from the circuit and removed to the ground; otherwise, the patient should not be moved at all. Artificial respiration should be started immediately. Although many methods have been devised, we have gotten as good results from simply turning a patient on his abdomen and using artificial respiration by pressure over the lower thoracic region, not over 20 to the minute. This should be continued for hours provided any pulsation is present. It is necessary to watch such a patient when respirations are re-established and consciousness returns, because a great many of these persons will become highly excited and the first tendency is to run. The danger is not over when respiration is re-established, for if the patient is not kept perfectly quiet for hours, slight exertion may cause auricular fibrillation or a ruptured heart, also, a secondary respiratory paralysis may occur. It is my principle to instruct our employees that a patient should be left absolutely quiet as near to the scene of injury as possible for at least one hour after respirations have returned and, then, to move this patient as carefully as possible to the hospital. I cannot impress too forcefully on you not to remove these persons to the hospital immediately after they become shocked nor immediately after respirations have returned. When a physician is called to the scene of the accident, I wish to impress that, as a rule, no drug should be given and the entire treatment should be absolute quietness and artificial respiration.

Most cases of electric shock are due to asphyxia following respiratory paralysis. In these cases, you can readily see that the brain centers are over stimulated, therefore, any stimulating drug would tend to stimulate the already exhausted centers. The principles here are as in other forms of shock and we do not wish to over stimulate. As electric shock is usually a respiratory paralysis, we, therefore, do not wish to use any depressant drugs such as morphine or any of the opium group, because we further depress the respiration. Therefore, I wish to urge neither to use stimulating nor depressing drugs. It has been my experience that in the few cases of primary cardiac paralysis due to electric shock these cases die in spite of any drug administered. It would seem logical in cases where the condition is primarily one of auricular fibrillation or ventricular fibrillation to use some drug, such as ephedrine, directly into the circulation, however, these cases are so few and their diagnosis made so rarely that I feel much better results will be gotten in the average case not to use any drugs at all. I would not hesitate, however, in a case where there is no pulsation or with a fibrillating pulse to use ephedrine directly into the circulation, but this should be done with care as we usually have an accompanying respiratory paralysis.

WHAT I have said before is for your general information. From a surgical standpoint, and that is what we are most interested in, I will now take up the treatment of the patient with electric shock and electric burns after he enters the hospital. Even after entering the hospital it is not well to over stimulate or over depress this patient, as sometimes he will go into a secondary shock with respiratory paralysis, which is just as severe as a shock in the first instance, and may die in this condition. I have had two such cases go

into secondary respiratory shock several hours after recovering from the original condition. The patient at the time of entering the hospital will be highly nervous and the pain from the burns severe. It has been my principle to use in these cases some mild hypnotic, such as evipal or other mild preparations, although it may be necessary to use them continuously, and to use opiates only as a last resort when pain can be relieved in no other way.

Attention now must be given to the original burns from electricity. These burns vary in degree, but the average burns from a high-powered electric wire, if not too extensive, look innocent enough, but are very deep and destructive. They are hard, almost mummified; if seen early enough, they are very hot to the touch and have a distinct outline. Surrounding these burns is always a secondary burn which is due to the flash and is no more than a rather severe fire burn. It is this secondary burn that usually gives the patient the most discomfort for the first few days. These burns along with the accompanying electric burns should be treated as any other first or second degree burn. To sum up this treatment, for the first few days after entering the hospital a patient's shock should be combated. I feel that occasionally a blood transfusion is necessary, but in most cases intravenous saline solutions are sufficient, treating the nervousness and the burns at the same time. After a few days in the hospital, the patient will begin to complain of more or less severe neuritis and pains in the deep electric burns. At this time, I do not hesitate to give opium, however, I wish to impress on you the importance of giving as little opium as possible as these cases are always long drawn out, and sometimes it is harder to get the patient off the opium than it is to cure the disease. Careful nursing is a great factor in severe electric shock cases.

LET me call your attention to an electric burn—it looks innocent, but an electric burn is entirely opposite in character from an ordinary fire burn. A fire burn is cone shaped with the base of the cone on the surface diminishing as it get into deeper structures, whereas, an electric burn is an inverted cone with a small area on the surface and becoming greater as it penetrates the tissue.

The greatest mistakes in the treatment of electric burns have been in trying to operate on them too soon and expecting healing too soon. An electric burn cannot be hurried and you must wait sufficient time until the line of demarcation between the burned area and the healthy area has taken place. Sometimes, this takes from six to 10 weeks and in some cases I have noticed it takes several months. In cases of severe burns of the arm or leg where the arm or leg is completely mummified, I want to urge that no amputation be done for several days or until the time interval has elapsed to allow this patient to become fully recovered from his shock. In cases of deep burns over the body where amputation is not involved, I urge that radical treatment in these cases be delayed as I have described above. Where operations are done too early, the results will be poor and it will be necessary to do numerous additional operations. Among complications which should be watched very carefully and which occur frequently in electric burns is first, gas gangrene. Why gas gangrene should occur in these burns I do not know, but it is one of the most frequent complications and usually occurs from 12 to 36 hours following the injury. By the use of gas gangrene serum and drugs of the sulfanilamide group, I have not been able to prevent these occurrences; therefore, I would suggest that should gas gangrene occur it be treated as gas gangrene in any other surgical condition. These cases of gas gangrene have usually occurred where the burns have been either on the lower or upper extremities. Tetanus antitoxin should be given as tetanus may be a late complication. Infection and septicemia seem no more common in electric burns than in other burns and should be treated in a similar way. One of the most dangerous complications following deep electric burns is delayed severe hemorrhage. Many of these cases where the burns look to be healing well and healthy will suddenly slough into a large vessel and this vessel will bleed profusely. It is for this reason that constant nursing attention is necessary. I have had one such case in a neighboring city where the popliteal vessel sloughed and the patient bled to death before the nurse knew anything about it. I have recently had a case where, after 12 weeks, the radial vessels sloughed and it was necessary to immediately apply a tourniquet and take this patient to the operating room to ligate the vessels. Another surgical complication, of course, is gangrene of the parts due to coagulation of the blood vessel which causes an insufficient blood supply, and this should be treated as gangrene in any other condition. A frequent complication in these burned cases is a temporary mental derangement. This condition clears up in all cases within a short time. Malignancies occur no more frequently in scars from electric burns than in scars from other burns. The neurotic complications will be taken up in my remarks on the outcome of these cases. Of course, there are other complications which occur, such as sloughing of the tendons, osteomyelitis, and such complications as occur in other severe burns.

I wish to call the attention of the surgeon to the character of a deep electric burn. These burns, as I have stated, are inverted cone shape in character. A line of demarcation will form and the slough can be removed at the proper time without difficulty. I, especially, wish to call your attention to cases where there is involvement of the bone. The amount of this involvement does not show in an x-ray and its line of demarcation very seldom occurs before six to 12 weeks following the electric burn. In ordinary cases of necrosis of the bone, the necrotic area is soft and the sequestrum is definite and can readily be identified and removed. In cases of an electric burn, however, it has been my observation that the area

of bone involved is not soft but is rather hard, and in some cases almost the consistency of a china plate. After the electric burn has become healthy, which is many weeks following the original burn, it is necessary to remove the hard area of bone until the healthy and softer area of bone is encountered. As contrary to some observers, an electric burn is not easy to heal, but is hard to heal and the healing process is very slow, it is necessary that the patient, the employer and the surgeon have patience enough, and if so, a good result can be gotten in most of these cases. However, an operation done too early is a wasteful procedure. It has been my experience in these cases that a skin graft takes easily over an electric burn, but the same principles apply in these cases for skin graft as in other burns. The time element, however, is usually greatly delayed. The wound must be healthy and the area granulating sufficiently, and if such precautions are used, skin grafts are very satisfactory. In cases where extensive plastic procedures must be resorted to, the delay is important in order to get the best results.

MANY nervous manifestations which may occur and reoccur during a period of six months have all been overcome to a great extent. I have had no cases of permanent paralysis from electric shock. It is possible, however, to get a paralysis from an electric burn due to the destruction of the nerve. Better results have been obtained in these nervous conditions, especially, where there is litigation, when a settlement has finally been made, and I would urge that the patient as well as the company make early settlement in these cases where possible. So many of these nervous symptoms are exaggerated by the patient's lawyer or by the patient's friends telling him the many permanent disabilities he will have. I, also, have found it well to get the patient to work as soon as possible, assuring him that by occupying his mind with his work the nervous symptoms will disappear much sooner. To sum up these nervous phenomena, in many cases of electric shock, I have seen no permanent neurosis result.

Now, as to the results in electric burns, I would say they have been good and differ in no way from disabilities occurring in other injuries of the same magnitude. I believe if these electric burns are left alone for a sufficient time they can be considered and treated as any other injury.

Time will not permit me to go into the microscopical, histological and pathological changes in cases which die from electric shock; however, I will mention such changes which have been found at autopsy on cases who have died from electrocution, as petechial hemorrhages in the central nervous system, chromatolysis of the neurons, curious dilatation of the perivascular spaces, changes in the peripheral nerves and certain vasomotor changes. I, also, have not gone into the claims and suggestions made by physicians in isolated cases nor have I mentioned treatments and drugs which have proved of no value.

In conclusion, I will mention shock and burns by lightning and state that the general principles which apply to electric shock and burns should be applied to cases burned and shocked by lightning.

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Gastric Physiology

—Recent Developments—

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BECAUSE of the prevalence of gastric and duodenal ulcer in our population I believe every physician is interested in the subject of the cause of gastric ulcer and its management. Clinical experience indicates that anxiety factors, nerve strain, and muscle tension play a very important etiological role in the initial onset of a lesion of the stomach or duodenum, and particularly in its recurrence. This is a factor which we have attempted to duplicate in the laboratory in experimental animals, but have failed. When we make our animals anxious or nervous, or excite them, they become accustomed to the procedure and take it as a matter of fact or as a joke. This is not true of the human being. The human being shoulders responsibilities, and some of us have great difficulty in relaxing and forgetting them or treating them as a matter of fact.

Both clinical and experimental evidence shows that the corrosive action of gastric juice is a prime factor in preventing or delaying healing of a lesion after it is produced. For this reason we have been conducting fundamental physiologic investigations in regard to the mechanism of the production of acid.

Obviously if anxiety factors are important in the etiology of gastric ulcer, the first thing that we should attempt to do in the management of such a patient is to try to teach him how to live and how to eat, and to try to develop in him a new philosophy of life. Man has learned to shoulder responsibilities, and in the same way he should learn to forget them, at least at the end of the day or from time to time during the day.

Unfortunately we cannot teach all of our patients how to live and how to eat so as to prevent a recurrence of the ulcer. Also, many duodenal ulcer patients secrete excessive amounts of acid when their ulcers are active, and we encounter difficulties in neutralizing and controlling their secretion of acid. If we could turn the acid secretion on and off at will, we should possess an important therapeutic device. We have now for several years been attempting to learn how to do this.

Our approach to the problem has been based on an old clinical observation. You all know that for almost 100 years fat in some form—olive oil or milk and cream—has been used in the diet of the ulcer patient. This is because undigested fat inhibits gastric secretion and motility. In this connection, however, it should be kept in mind that the digestive products of fats, fatty acids and soaps, acting in the intestine stimulate gastric secretion. This along with the effect of the salts formed from the reaction of HCl with the alkalies frequently used in treating the ulcer patient causes the stomach to secrete continuously after cessation of the frequent feedings, usually about 7:00 P.M. This is one of the reasons why a "therapeutic aspiration" must sometimes be done from 11:00 P.M. to 2:00 A.M. to relieve the patient from the distress caused by the presence of the excessive secretion of the otherwise empty stomach. Hence fat in the undigested state exerts a favorable effect on the ulcer, but in the digested state an unfavorable effect.

It was believed that if we could ascertain why undigested fat inhibits gastric secretion, we might discover a method for controlling the secretion of acid.

When Ewald first made the discovery that undigested fat inhibits gastric secretion he suggested that a nervous reflex mechanism was involved. Later Pavlov and Carlson supported the same view. However, several years ago we made an observation which indicated that this view was incorrect. We prepared animals with a transplanted pouch of the stomach and found that when these animals were fed olive oil or cream the secretion and the motility of the pouch were inhibited. When finely emulsified fat or fatty chyle was injected intravenously, the secretion and the motility of the transplanted pouch were not influenced. These observations showed that a "hormone" mechanism was concerned, or that when undigested fat comes into contact with the mucosa of the intestine it causes a substance to be formed which enters the blood and inhibits gastric secretion and motility. This substance is called "enterogastrone."

We then proceeded to extract this substance from the intestinal mucosa. We soon made an extract which would inhibit gastric secretion and motility in the dog, even when gastric secretion was stimulated with histamine. Unfortunately we have been unable to date to make an extract suitable for human use.

Since a number of hormones have been found in the urine, we decided to examine urine to ascertain if enterogastrone is present. It was thought that if it were present, it might be more easily isolated. We have found a substance in male and

female human and canine urine which inhibits gastric secretion. This substance has been called "urogastrone," since we are not certain whether it is enterogastrone. We have found that it does not disappear, at least entirely, from the urine of enterectomized dogs. Hence, we suspect that it may originate from other tissues, possibly the hypophysis.

We have "purified" urogastrone sufficiently to inject it into ourselves. It very definitely depressed the gastric secretory response to histamine. However, it unfortunately caused too much local irritation to use in ulcer patients. We hope to be able to remove the irritating substance. If we are able to do this, we shall possess an agent which will be useful in controlling the hypersecretion of gastric juice.

DURING the past eight years we have been testing in our laboratory the effectiveness of the various managements for peptic ulcer. In the patient it is difficult to establish the superiority of one management over another because of the natural history of the disease and because the patient is difficult to control. The disease in some patients is more easily managed than in others. Some recurrences in the same patient are more easily managed than others. This renders it difficult to state that one management is superior to another. The same is true of surgery. After gastroenterostomy, recurrences occur too frequently to conclude that this management is satisfactory. The same is true of subtotal gastric resection. In regard to surgical management it appears from laboratory and clinical observations that the only way to prevent a postoperative jejunal ulcer from recurring is to remove all of the acid-secreting mucosa, or to reduce acid secretion to such an extent that jejunal irritation does not occur.

In our laboratory we use the Mann-Williamson dog to test the effectiveness of various ulcer managements. This type of animal has a gastrojejunostomy with diversion of the alkaline pancreatic juice and bile to the lower ileum. Ninety-five per cent of such animals when fed an ordinary diet of meat, milk and bread develop a jejunal ulcer and die of perforation or hemorrhage within three months. Hence this type of animal constitutes an excellent and a rigid test preparation for an ulcer management. This is particularly true because this experimentally produced ulcer is analogous to postoperative jejunal ulcer in man, which is the most difficult type of ulcer to manage.

We have found that an easily digested diet, rich in vitamins, delays the development of the ulcer in our animals. The administration of alkalies has the same effect, though alkalies do not promote healing of the ulcer. Gastric mucin was superior to alkali and promoted healing in some instances; it was not a perfect remedy, however. When we combined the special diet with almost a complete removal of the acid-secreting mucosa, ulcers did not occur even after two years of observation.

These animals manifest a hypercontinuous secretion of gastric juice. When we found that this secretion was not abolished by atropine, we believed that histamine was produced by the irritated jejunal mucosa and was the cause of the hypersecretion. About this time the use of aluminum hydroxide gel was introduced for the management of peptic ulcer. This substance has antacid and mildly astringent properties. We thought that it should be of value in controlling the hypersecretion because its astringent action might ameliorate the irritation and reduce the formation of histamine.

However, when we gave aluminum hydroxide gel or colloidal aluminum hydroxide to our animals four times daily, or on the hour from 7 A.M. to 8 P.M., we found that the management was not effective. We noted that after a few weeks on the therapy the animals had a diminished appetite. A diminished appetite in these animals causes a loss of weight which predisposes to the development of ulcer. We suspected that the loss of appetite was due to a phosphorus deficiency, since in our animals aluminum hydroxide could produce a phosphorus deficiency because of the diversion of alkalies to the ileum. For example, aluminum hydroxide reacts with HCl to produce aluminum chloride. When plenty of alkaline pancreatic juice is present, the aluminum chloride is converted to aluminum hydroxide in the intestine. But, in the presence of a deficiency of pancreatic juice and bile, the aluminum chloride reacts with phosphates to form the very insoluble aluminum phosphate, and hence phosphorus loss occurs in the stools. For example, we found that if one gives sufficient aluminum hydroxide to a person, the phosphates can be caused to disappear from the urine; their excretion is always reduced.

Thus, in order to give the aluminum hydroxide gel therapy a fair test in our animals and to examine the truth of our belief regarding why aluminum hydroxide should be beneficial, we decided to try aluminum phosphate gel.

The aluminum phosphate gel was made for us by Wyeth, of Philadelphia, and possessed antacid and mildly astringent properties. However, it is not as good an antacid as aluminum hydroxide gel in proportion to content of aluminum.

We gave the aluminum phosphate gel to 23 animals and ulcer occurred in only three. These three animals did not eat well and when one was "force fed," the ulcer healed. This was a remarkable result, since a similar result had not been obtained with any previous type of medical management.

We then decided to permit an ulcer to occur and to ascertain if it would heal after aluminum phosphate gel therapy. Thirteen animals were so treated, and healing occurred in all. In several dogs the ulcer was permitted to recur several times, and the ulcer healed each time after the institution of therapy. The presence and healing of the ulcer was proved by exploratory operation. This result was also very striking, much better than the result we had obtained with gastric mucin.

We have not concluded that aluminum phos-

phate gel therapy is superior to aluminum hydroxide gel therapy. Such a conclusion would not be warranted, since most ulcer patients, as far as we know, produce normal amounts of pancreatic juice and bile. If a patient does not produce adequate pancreatic juice and bile, then aluminum hydroxide gel is contra-indicated and aluminum phosphate gel should be used. Some patients with duodenal ulcer may have an associated involvement of the pancreas; such patients should receive aluminum phosphate gel. It should be pointed out further, that if the ulcer diet contains large quantities of milk, aluminum hydroxide is much less likely to produce a phosphorus deficiency because milk contains considerable phosphate.

So far, we have tried aluminum phosphate therapy on only thirty-odd patients. We can only report that the patients have responded well and possibly better to this therapy than to previous therapies. We are not making enthusiastic claims regarding aluminum phosphate gel therapy for peptic ulcer. We are too familiar with the final outcome of over-enthusiastic claims regarding new therapies for peptic ulcer. We are too familiar with the natural history of peptic ulcer in man to be over-enthusiastic regarding any palliative management. We plan to continue this attitude of mind and to insist that the proper therapeutic approach is the prevention of the disease by hygienic eating and living, especially by that type of person who is constitutionally or temperamentally predisposed. This attitude of mind, however, does not dampen our desire and hope to find the best method for the control of the acute exacerbations and manifestations of the disease and for the prevention of recurrences in those persons who cannot or will not practice adequate hygienic eating and living.

Hypertension

—*Significance and Treatment*—

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I SHALL try to cover a few of the points which ordinarily are inquired about. According to our best insurance reports, the hypertensive group constitutes the largest number of deaths of any disorder that they have in their files. Actually some 500,000 people are involved who die either directly or indirectly of this disorder. With newer means of diagnosis we are able to break down sufferers into various groups, such as hypertension due to pituitary disease (such as Cushing's disease), suprarenal tumors, unilateral renal disease such as lesions obstructing the lower urinary tract, and pyelonephritis. Many of these patients with renal aspects will respond to specific treatment; Braasch and others have brought the blood pressures entirely to normal under treatment. In these patients there are also cerebral lesions, definite neurologic lesions, emotional states that do something to bring about definite elevation of blood pressure. At Northwestern University we frequently see patients admitted in excellent physical state with high blood pressure whose pressures by accurate readings would go from 140 and 150 to 200 on physical examination. The fact that a man is being examined for a job will sufficiently raise his pressure as to put him in the unemployable class. We have more than one in that group who is physically well but whose blood pressure is far above normal. That imposes upon all of us a burden of responsibility in differentiating between real vascular diseases and those which are not. Those who come in the first group are nervous and emotional, or anxiety states.

So far as insurance companies go, a man whose blood pressure is over 140 generally is not insurable; therefore, he is not employable and often because of these figures a young man becomes a confirmed blood pressure neurotic. Furthermore, he and his are dependent upon social organizations for their maintenance. So this group has rapidly put upon the taxpayer or the free clinic a big problem.

I THINK it is very important for all of us to study this problem of potential or suspected vascular disease before we really cast it aside. Older people who come to our clinic with blood pressures of 220 or over may well run a pressure of 100 or lower when they are compensated. Perhaps lack of blood supply will be sufficient to bring about this hypertension about which we have all heard for many years but have not had experimental evidence to show the reason for it. It is not uncommon for a patient to drop his blood pressure, but anyone's rising blood pressure should be a danger signal to us and should make us determine whether or not the left ventricle is giving trouble.

I should like to mention something about the endocrine aspect of hypertension. We are hearing more about the hormones every day. We are learning more about the different types of endocrine diseases with which blood pressure may be associated. The obese type of individual may have a disorder related to endocrine disturbance. I want to point out the significance of the menopause in this connection, because so many patients may appear at your office for the first time with a history of onset of hypertension at or about the time of the menopause. By means of endocrine therapy today, most if not all of the symptoms of hypertension, along with its associated dangers, may be alleviated in a certain number of patients.

NOW we shall take up the renal section. We must think about anything that will press upon the kidney either from within or without. Certainly anything that presses from within, such as cystic disease or tumor or pyelonephritis or hemorrhage, is an obvious factor. Braasch and his group at the Mayo Clinic have published a review of a series of patients studied from the standpoint

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of obstruction in the kidneys. They suggest to us that the kidney itself does not often become involved or produce hypertension, but, when it does, it falls within our province to work out an accurate diagnosis because such patients will respond to surgical treatment.

Benign and malignant hypertension constitutes in our experience more than 90% of all hypertension. We mean the benign hypertension patient whose pressure is well above 200 and fluctuates from time to time. It is this patient who gets into trouble. Sixty-five per cent of these will develop heart failure; 20% will have cerebrovascular accidents, and 8% will end up with renal failure, so the kidney becomes a small part of the management. The cerebrovascular accident becomes a worry because we never know when it may interrupt the patient's life, but, by and large, 65% of these patients will have a heart problem.

Ancestry also plays a very important role in this disease. Seventy-six per cent of persons born of aged parents who have hypertension will also develop the disease; 90% of persons born of parents who have hypertension and as to whom both sides of the family show a history of hypertension will also develop the disease. People cannot get rid of their ancestors.

WE have long known the effects of emotional strain, work, worry, stress and strain, whether at home or in business. These are aggravating factors of fundamental potentialities, and that leads up to the mention of therapy.

For years sedation has been the way of treatment—bromides, chlorides, and more recently phenobarbital, have been used, and even more recently still the new medicines brought out each year. This brings out only one established fact and that is that the hypertensive individual does well by being buffered against stress and strain and shock. However, there are more specific things we can do. I spoke of the menopause and obesity, etc., and I repeat that our control of the metabolic states is to be considered.

Our psychiatric friends are worried about the negro population. The negro is docile but he has hypertension. That somewhat refutes the attitude that emotional strain is a factor in hypertension, but there are other things to remember. So far as you and I are concerned, since 65% of these patients will have heart failure, we should look for the earliest manifestations of cardiac embarrassment. I wish to emphasize that point because so many of these patients who live a long time could have lived longer if they had been adequately supervised, and if they had been protected against myocardial fatigue and arteriosclerotic changes, and had kept their work within their capacity and supported the heart muscle by proper medication.

At this point it should be said that people with hypertensive vascular disease do very badly resting. We have tried resting them. We have taken them off on trips and have found that they do best when allowed some activity and interests. In evaluating the role of effort in these cases, we have sent patients down three flights of stairs and back up the three flights and measured the pressure before and after. Then we have sent them for two-mile walks outdoors. Some people who have arteriosclerotic damage will show an increase in pressure with effort. In the main, however, we have found that these people are much better at work or exercising moderately.

I AM anxious to point out a few things concerning the early physical findings. These people have a warm, moist skin, a sweet-sour odor to the breath, and tender shins. Do not wait for later symptoms with increased pulse and cyanosis and edema, as they are all very late symptoms. You should pick it up much earlier when you can support them and keep them on the job. Laboratory tests will show very little except an increase in the volume of urine during the night and decrease during the day.

As to dropping the pressure, there is danger in this in some instances. An older individual who had a high-grade sclerosis, and who had had one cerebrovascular accident and recovered, came in because of symptoms of headache, dizziness, insomnia and cardiac manifestations but chiefly headache. Insomnia required sedation so that he could not carry on his job. We were successful in dropping his pressure, but when it reached a level of 150/90 the patient began dragging his leg. Allowing the pressure to escape, he returned with the same symptoms and asked to be taken down again. So we have seen in a given instance a return of the old lesion in an older sclerotic individual after dropping the blood pressure below a certain point. Another danger is that with a sudden drop in pressure these patients frequently thrombose.

The modern therapy is directed at vasomotor relaxation, adjustment to duties and sedation, but in the main keeping the patients on the job because they stay better. The surgical problems do not fall within our province, but so far as we know no patient shows good results surgically if he does not have a high degree of vasomotor relaxability. Hypertension patients who have shown a drop in red count, whose sediment rate is high and whose blood viscosity is normal have not done well by any form of treatment; they are soon put in the malignant hypertension group, and life expectancy is very much shortened.

Chronic Arthritis

—and Re-employment—

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TO THE layman, chronic arthritis is most commonly associated with crippling of the spine or extremities and with serious disability. Rarely is it considered compatible with a fair measure of health and relative freedom of physical activity. So prevalent is this concept of

universal crippling that it very often difficult for individuals with chronic arthritis to find employment. Employers fear that the arthritic will again become disabled and require compensation. They believe that special considerations will have to be given him in his work and that his occupational efficiency will almost always be decreased by his disease.

This whole question of the re-employment of chronic arthritics is, therefore, a vital one to the patient, to the employer, as well as to the physician who attempts their general rehabilitation. The latter is faced with the problem, posed both by patient and employers, of giving answers to questions of the following nature: What are the chances that the patient who is suffering from chronic arthritis will be able to return to work? Are these individuals able to continue in their employment after they secure it? Must they be given easier types of work? Does work, particularly of a strenuous variety, lead to exacerbations of their arthritis?[1]

In this paper an attempt is made to throw light upon some of the problems in question through the analysis of the re-employment data of a group of 198 chronic arthritics. This series consists of all the male patients suffering from chronic arthritis who were discharged from the wards of the Robert B. Brigham Hospital during the 10-year period of January, 1928, to January, 1938. Patients who stated they were students in school or college at the time of their admission to the hospital were excluded from the study. Out of the total of 198 individuals in the series 141, or 71.2% were given the diagnosis of atrophic (rheumatoid) arthritis and 57, or 28.8% received the diagnosis of hypertrophic (osteo) arthritis.

TABLE I.
AGE FREQUENCY DISTRIBUTIONS

	Atrophic Arthritis		Hypertrophic Arthritis		Total	
Age	No.	%	No.	%	No.	%
18-19	1	0.7	—	—	1	0.5
20-24	10	7.1	—	—	10	5.0
25-29	19	13.5	—	—	19	9.6
30-34	38	27.0	1	1.8	39	20.2
35-39	21	14.8	4	7.0	25	12.6
40-44	10	7.1	4	7.0	14	7.0
45-49	13	9.2	5	8.8	18	9.0
50-54	12	8.5	10	17.3	22	11.0
55-59	5	3.6	9	15.8	14	7.0
60-64	7	5.0	9	15.8	16	8.1
65-69	2	1.4	8	14.4	10	5.0
70-74	3	2.1	4	7.0	7	3.5
75-79	—	—	3	5.1	3	1.5
	141	100.0	57	100.0	198	100.0
Average age		42.4		56.2		46.3

AGE. The age distributions for both forms of chronic arthritis at the time of admission to the hospital are to be found in Table I. The average age of the total series is 46.3 years. The atrophic arthritics have an average age of 42.4 years while the hypertrophic are almost 14 years older with an average age of 56.2. The atrophic arthritics range in age from 18 to 74 with by far the greatest emphasis in the second and third decades of life. The hypertrophic arthritics, on the other hand, have none of their numbers under 30 years of age and concentrate most heavily in the fifth and sixth decades.

EMPLOYMENT STATUS. Our series is divided into three groups with respect to employment status at the time of or just prior to hospital admission. All individuals who were actually engaged in some gainful occupation until hospitalized are referred to as *employed*. Those individuals, in the opinion of the admitting physician, who had no physical disability preventing employment just prior to their hospital admission but were not working for reasons apart from health are designated as *employable but idle*. Those patients who were crippled by arthritis or other diseases so that they could not work are called *non-employables*.

TABLE II.
EMPLOYMENT STATUS AT TIME OF ADMISSION TO HOSPITAL

	No.	%	Average Age
Employed.....	131	66.2	44.1
Employable but idle...	41	20.7	46.4
Non-employable.....	26	13.1	41.4
	198	100.0	

From the data in Table II we find that 131 individuals, or 66.2% of the series, fell into the actually employed class, 41, or 20.7%, were employable but idle, while the remaining 13.1% were non-employable. It is interesting to note that the non-employables were the youngest in mean age with an average of 41.4 years, and the employable but idle group were the oldest with an average age of 46.4 years.

Of the 131 individuals who were actually employed up to the time of their admission to the hospital, 63 were suffering from a generalized arthritis, 38 had an early spinal arthritis of the Strumpell-Marie type, and the remaining 30 had milder forms of arthritis involving only one or more joints. In the case of the employable, but idle group the arthritis was not severe at admission in any instance and there were no deformities. Of the 26 who were non-employable, 12 had spinal arthritis of the Strumpell-Marie type with ankylosis of the spine and hips, while nine others had severe generalized arthritis with extensive deformities. Two other members of this group had serious heart disease, two were very old men with various minor disabilities, and one patient had been recently discharged from a tuberculosis sanatorium.

OCCUPATIONAL STATUS. The occupations in which the patients had been engaged before coming to the hospital varied greatly. Owing to the small size of the series a simple and arbitrary division was made into three occupational groups: Professional, skilled-labor, and unskilled-labor. In the professional group there were two teachers, two ministers, and one veterinarian, a total of five

1. Many important considerations such as form of occupation, length of occupational service, severity of arthritis, regional distribution of arthritis, age of re-employment, form of re-employment, efficiency after re-employment, and a host of others, cannot be undertaken in this paper owing to the relatively small size of the series available.

individuals, or only 2.6% of the total series. The skilled-labor group included carpenters, plumbers, mechanics and other workers whose occupations involved a certain amount of skill and training. In this classification there were 68 individuals, or 34.3% of the entire series. The unskilled labor group formed by far the largest element with 125 men, or 63.1% of the total, and were for the most part laborers of the pick and shovel variety.

The extent to which these occupational groups were differentiated with respect to their employment status at the time of admission to the hospital may be seen from the data in Table III. All

TABLE III.
OCCUPATIONAL STATUS OF EMPLOYMENT GROUPS AT ADMISSION

	Professional		Skilled Labor		Unskilled Labor		Total
	No.	%	No.	%	No.	%	
Employed.....	5	100.0	44	64.7	82	65.6	131
Employable but idle.....	—	——	18	26.4	23	18.4	41
Non-employable	—	——	—	——	—	——	—
	5	100.0	68	100.0	125	100.0	198

five individuals of this small professional group were employed at the time of hospitalization. The skilled and unskilled labor groups showed approximately the same proportion of their actually employed when admitted to the hospital, but the proportions of employables and non-employables were different in these two labor classes. The unskilled labor group had a greater percentage of non-employables than the skilled labor class and a smaller employable but idle category.

On admission to the hospital an attempt was made to bring the chronic arthritis into quiescence, to prevent deformity, or to correct deformities if they had already occurred. The average length of stay in the hospital for the individuals in this series was 67 days. In the majority of the patients additional articular damage occurred and in a small number deformities increased despite treatment.

Employment Status

THE DATA dealing with the employment status of the patients immediately following discharge from the hospital wards are given in Table IV, where they may be contrasted with comparable figures at the time of hospital admission.

TABLE IV.
COMPARATIVE EMPLOYMENT STATUS BEFORE AND AFTER HOSPITALIZATION

	At Admission		At Discharge		At Present Time	
	No.	%	No.	%	No.	%
Employed.....	131	66.2	73	36.8	85	46.9
Employable but idle.....	41	20.7	31	15.7	16	8.8
Non-employable	26	13.1	69	44.9	68	37.5
Died.....	—	——	5	2.6	12	6.8
Total.....	198		198		181	
Unknown.....					17	
					198	

It may be seen that there was a sharp reduction in the proportion of individuals who returned to work, no appreciable change in the employable but idle category, and a marked increase of the number of persons unable to work here designated as non-employables. At the time of admission 66.2% of the series were employed while immediately after discharge from the hospital only 36.8% resumed work. The total number of employables, including the employed and the employable but idle classes were markedly reduced from 86.9% on admission to 52.5% on discharge. There was more than a three-fold increase in the percentage of non-employables, from 13.1% on admission to 44.9% on discharge. Five patients died. Many of the patients who were employed at the time of admission to the wards worked until they were completely incapacitated by arthritis and then came to the hospital. Their treatment and convalescence were frequently of long duration. This is one of the reasons for the great difference between the number of men employed on admission and on discharge.

A number of patients who were unable to work at the time of discharge from the hospital wards have since returned to work. A prolonged period of convalescence was often required to make reemployment possible. During this period of convalescence attempts were made to improve the general health of the patients and to decrease their disabilities. This was accomplished for the most part by the work of the Home Service Clinic of the hospital to which the patients made frequent and regular visits. This clinic had in constant attendance an internist, an orthopedic surgeon, a physiotherapist, and a social worker. In addition, a nurse attached to the clinic made periodic visits to the homes of the patients to assist in the carrying out of treatment. The concentrated effort of all these members of the Home Service Clinic staff contributed greatly to the welfare of the patients. In spite of this attention it was deemed necessary to readmit 32 of these patients to the hospital wards for further treatment of their arthritis.

It was found at the time of discharge from the hospital wards that it was more difficult for patients to return to occupations which required great manual skill. While useful function was usually possible, movements which required intricate coordination were often performed slowly and imperfectly. In spite of prolonged training and various surgical procedures which improved motion in the damaged joints, these did not regain the skill and grace which were originally present. In those cases where some permanent crippling was inevitable an appraisal was made of the physical and intellectual resources of the patient. Plans were instituted to guide the patient into whatever vocation seemed most advisable. In this guidance, various social agencies played an important role. Cooperation was obtained in the case of a few employers who gave the patients lighter work until they were physically able to return to their old jobs.

A survey has been made of the present occupational status of our arthritic patients in order to discover what changes had taken place in employability after a period of several years. The data are to be found in Table IV. Seventeen cannot be traced at this time, having moved away or for some reason or other lost contact with the Home Service Clinic. Of the remainder, 85 individuals, or 46.9% are still employed, only 16 persons, or 8.8%, are employable but idle, and 68, or 37.5% are non-employables. Forty-two of these 68 non-employables are permanently crippled by chronic arthritis. And lastly, 12, or 6.8%, are now dead, five as a result of cardiac disease, three from pneumonia, two from acute infections and one from nephritis, one was a suicide.

It may be seen, therefore, that the present employment status of the chronic arthritic shows a very slight improvement over that at discharge with a greater proportion of employed and employables, and a smaller percentage of non-employables. Accordingly from these data it appears that the element of time does not seem to act as a deteriorating factor in the re-employment status chronic arthritics. Whether or not it may be considered an ally is not yet certain, although suggestions of a slight improvement are present.

We may analyze this situation more fully by studying the changes in status of each of our employment groups separately from the time of hospital admission to the present. Table V gives these data.

idle group from 21.9% at discharge to 6.2% at the present. There was no change in the proportion of non-employables from the time of discharge to the present.

Of the 26 non-employables at time of admission all were still non-employables at the time of hospital discharge, while at the present time four, or 15.4%, have jobs. Accordingly, there has been an improvement in employment status of this category of patients.

The data in Table VI will give the reader an opportunity to observe the re-employment status of the chronic arthritics discharged from the Robert B. Brigham wards for each successive year

TABLE VI.

YEARLY CENSUS OF CHRONIC ARTHRITICS DISCHARGED FROM ROBERT B. BRIGHAM WARDS AND RE-EMPLOYMENT STATUS

	Discharged from Wards Number	Failed to return to work		Returned to work		Stopped work	
		No.	%	No.	%	No.	%
1928	5	2	40.0	3	60.0	2	66.7
1929	11	7	63.6	4	36.4	2	50.0
1930	14	7	50.0	7	50.0	4	57.1
1931	11	9	81.8	2	18.2	—	—
1932	9	5	55.5	4	44.5	—	—
1933	23	13	56.5	10	43.5	2	20.0
1934	16	6	37.5	10	62.5	—	—
1935	39	15	38.5	24	61.5	1	4.5
1936	34	21	61.8	13	38.2	1	7.8
1937	36	23	63.9	13	36.1	—	—
Total	198	108		90		12	

TABLE V.

CHANGES IN EMPLOYMENT STATUS

	Employed when Admitted to Hospital				Employable but Idle when Admitted to Hospital				Non-Employables when Admitted to Hospital			
	On Discharge		Present Time		On Discharge		Present Time		On Discharge		Present Time	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Employed	67	51.1	73	59.4	6	14.7	8	25.0	0	0	4	15.4
Employable but idle	22	16.8	14	11.4	9	21.9	2	6.2	0	0	0	0
Non-employable	41	31.3	30	24.4	25	60.9	19	59.4	23	88.5	19	73.1
Died	1	0.8	6	4.8	1	2.5	3	9.4	3	11.5	3	11.5
Total	131	100.0	123	100.0	41	100.0	32	100.0	26	100.0	26	100.0
Unknown			8				9					

If we consider first the group who were employed at the time of hospital admission we find that out of these 131 individuals about one-half (51.1%) obtained employment on discharge, this proportion increasing somewhat to 59.4% at the present time. The employable but idle group at time of discharge formed 16.8% of the formerly employed class compared to 11.4% at the present survey. The total employables then show a very slight increase from 67.9% to 70.8%. The non-employable class diminished from 41 individuals, or 31.3%, to 30, or 24.4%. The number of deaths increased from one by the time of hospital discharge to six at the present time.

There were 41 patients in the employable but idle class at the time of hospital admission. Of these only 14.7% became employed at discharge, increasing to 25.0% at the present time. There was a very marked decrease of the employable but

from 1928 to 1938. It may be seen that from 1928 to 1932 inclusive the number of patients discharged from the wards was relatively small but from 1933 onward a sharp rise occurred. This period from 1933 through 1937 embraces 148 individuals, approximately three-fourths of the total number in this series. Just what the significance of these differences is from year to year in the proportion of individuals who failed to return to work in relation to such matters as type of medical treatment, severity of arthritis, variation in joint involvement, et cetera, is virtually impossible to assess from these limited data. Nevertheless, it is interesting to note that during the low point of the financial depression, from 1932 to 1935, there was an increase in the proportion of arthritics who returned to work after hospital discharge. During this period about 55% went back to work, compared to 39% in the 1928-31

period and 37% in 1936-37. Another point worthy of mention is the remarkable decrease since 1931 in the proportion of individuals who have left their jobs after having returned to work on discharge from the hospital. In 1928-30 of the 14 men who returned to work eight, or about 57% of the group, have since left their occupations. From 1931-37 of the 76 individuals who returned to work only 4 or 5 % have stopped working. It must be realized, of course, that the men of the 1928-30 period have been working longer since hospitalization than those of the 1931-37 period.

Occupational Groupings and Changes

THE changes in employment status for our series of arthritics from the time of hospital admission until the present period have been analyzed according to occupational classes. The figures representing these changes are to be found in Table VII.

TABLE VII.
OCCUPATION AND CHANGES IN EMPLOYMENT STATUS

	At Admission		Professional At Discharge		At Present	
	No.	%	No.	%	No.	%
Employed.....	5	100.0	4	80.0	4	80.0
Employable but idle.....	—	—	—	—	—	—
Non-employable	—	—	1	20.0	1	20.0
Died.....	—	—	—	—	—	—
			Skilled Labor			
Employed.....	44	64.7	25	36.9	29	46.0
Employable but idle.....	18	26.4	13	19.1	7	11.1
Non-employable	6	8.9	30	44.0	26	41.2
Died.....	—	—	—	—	1	1.7
			Unskilled Labor			
Employed.....	82	65.6	44	35.2	52	46.0
Employable but idle.....	23	18.4	18	14.4	9	7.9
Non-employable	20	16.0	58	46.4	41	36.4
Died.....	—	—	5	4.0	11	9.7

It would appear from the data that the occupational classes show no differentiation with respect to the proportion of arthritics actually employed, and only slight differences as regards their employability. Omitting the question of the professional class, there being only five individuals in this grouping, we find that the skilled labor and unskilled labor categories show virtually identical proportions of individuals classified as employed at time of hospital admission, at discharge, and at present. Although the employable but idle group is somewhat larger in the skilled labor than in the unskilled labor class (26.4% to 18.4%) on hospital admission, we find the same trend of decreasing proportions at discharge and at the present survey for both occupational classes. The point to be emphasized in connection with the non-employables is their higher representation in the skilled labor group than in the unskilled labor class *at the present time*, in spite of the fact that on hospital admission the proportion of non-employables in the skilled labor group was about one-half that of the unskilled labor element. It would seem that the skilled laborers during and after hospitalization are more subject to disabilities which prevent employability than the unskilled laborers.

Changes in Employment Status

TABLE VIII presents the figures for the employment status before and after hospitalization of our series of arthritics when separated into atrophic and hypertrophic groups.

TABLE VIII.
COMPARATIVE EMPLOYMENT STATUS OF ATROPHIC AND HYPERTROPHIC ARTHRITICS BEFORE AND AFTER HOSPITALIZATION

	Atrophic Arthritis					
	At Admission		On Discharge		Present Time	
	No.	%	No.	%	No.	%
Employed.....	90	62.9	52	36.4	59	46.1
Employable but idle.....	34	23.8	24	16.8	14	10.9
Non-employable	19	13.3	64	44.7	46	35.9
Died.....	—	—	3	2.1	9	7.1
Total.....	143	100.0	143	100.0	143	100.0
Unknown.....	—	—	—	—	15	—

	Hypertrophic Arthritis					
	At Admission		On Discharge		Present Time	
	No.	%	No.	%	No.	%
Employed.....	41	74.6	21	38.2	26	49.1
Employable but idle.....	7	12.7	7	12.7	2	3.8
Non-employable..	7	12.7	25	45.5	22	41.5
Died.....	—	—	—	—	3	5.6
Total.....	55	100.0	55	100.0	55	100.0
Unknown.....	—	—	—	—	2	—

It may be seen from these data that at the time of hospital admission there were a greater proportion of people actually employed among those arthritics with hypertrophic changes than those with the atrophic variety (74.6% to 62.9%). Yet, at the time of hospital discharge and at the present survey the proportions of individuals re-employed are essentially the same for these arthritic types. Both before and after hospitalization the atrophic arthritics had a greater percentage of their number employable but idle than was to be found among the patients with hypertrophic arthritis. The non-employable group was approximately equally represented in both arthritic groups on hospital admission and on hospital discharge, but the present survey of the employment status showed comparatively fewer non-employables among the atrophic category. It would seem, therefore, although a large proportion of both varieties of arthritic patients develop crippling conditions during hospitalization, that after discharge those individuals with atrophic arthritis have a somewhat better chance of improvement at least to the point of re-employability.

Table IX shows what disease conditions were responsible for the present non-employability of our arthritic series.

Only 61.8% of the whole group were not in condition to accept employment solely as a result of their arthritis. In other words, almost 40% of the patients discharged from the Brigham

wards, who are at the present time not fit for work, are not deterred from employability by their arthritis but by other disease complications which have afflicted them. The most common of these is heart disease, followed by old age debility, and kidney dysfunctions.

TABLE IX.
DISEASE FORMS OF ATROPHIC AND HYPERTROPHIC NON-EMPLOYABLES (present)

	Present Non-Employables					
	Atrophic		Hypertrophic		Total	
	No.	%	No.	%	No.	%
Crippled by arthritis	29	63.0	13	59.1	42	61.8
Heart disease	5	10.9	5	22.8	10	14.7
Tuberculosis	2	4.3	—	—	2	2.9
Kidney disease	2	4.3	1	4.5	3	4.4
Old age—general debility	2	4.3	2	9.1	4	5.9
Diabetes	1	2.2	—	—	1	1.5
Syphilis	1	2.2	—	—	1	1.5
Amyloid disease	1	2.2	—	—	1	1.5
Chronic colitis	1	2.2	—	—	1	1.5
Psychosis	1	2.2	—	—	1	1.5
Chronic bronchitis	1	2.2	1	4.5	2	2.9
Total	46	100.0	22	100.0	68	100.1

Our atrophic group compared with the hypertrophic category shows a slight excess of persons crippled by arthritis who are at present non-employable, but the difference is not statistically significant. The hyperthrophic arthritics are more frequently non-employable as a result of heart disease than the atrophic arthritics (22.8% to 10.9%), but this is probably associated with the greater age of the hypertrophic group.

Summary

AN ANALYSIS of the re-employment data of 198 male arthritics discharged from the wards of the Robert Breck Brigham Hospital during the 10-year period from January, 1928, to January, 1938, reveals the following results:

1. At time of or just prior to hospital admission about one-third of all the arthritic patients in this series were actually employed in some gainful occupation, about one-fifth of the group were employable but idle, and only around one-seventh were non-employables — crippled by arthritis or other diseases so that they could not work.

2. At time of hospital admission those patients who were classified as unskilled laborers had a greater percentage of non-employables among their number than the skilled labor class, and a smaller employable but idle category.

3. There was a sharp reduction in the proportion of individuals who returned to work immediately after hospital discharge. Only about one-third of the group resumed work although approximately one-half of the total number were physically fit for re-employment. There was more than a three fold increase in the percentage of non-employables during hospitalization, from 13% to 45%.

4. The element of time does not seem to act as a deteriorating factor in the re-employment status of chronic arthritics. After an average of about six years from the time of hospital discharge, there is a greater proportion of patients in this series now employed and employable, with a corresponding decrease in the percentage of non-employables.

5. During the low point of the financial depression, from 1932 to 1935, there was an increase in the proportion of arthritics who returned to work after hospital discharge. From 1931 to 1937 considerably fewer individuals had to stop working on account of their arthritis after post-hospital re-employment, than during the 1928-30 period.

6. The skilled labor group after hospitalization is more subject than the unskilled labor element to types of disease crippling which prevents re-employment.

7. The individuals with hypertrophic arthritis are more often employed up to the time of hospital admission than the atrophic arthritics. However, after hospitalization the hypertrophic arthritics have a greater proportion of their number among the non-employables than do the atrophic type.

8. Only 62% of the present non-employable group are unfit for work solely as a result of their arthritis. The remainder have other diseases which prevent them from returning to work. The most frequent offender in the latter group is heart disease which is more often found among the hypertrophic arthritics than in individuals with the atrophic variety.

Conclusion

USING the ward records of the Robert Breck Brigham Hospital as a yardstick, it would appear that only about one-fourth of chronic arthritics do not become re-employable in some capacity due solely to the severity of their arthritic condition. Contributing factors to the question of the probability of their re-employment include such considerations as occupational class and type of arthritis. Much more detailed and carefully collected data over a longer period of time are necessary for the successful elucidation of the many faceted problem of re-employment and chronic arthritis.

The writer gratefully acknowledges the assistance of DR. CARL SELTZER, of Harvard University, in the tabulation and interpretation of the statistical data.

The Common Cold

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THE "Common Cold" is so named because of its widespread occurrence. It is the most devastating of all sickness. It is prevalent in every civilized country of the world. Few, if any, individuals escape; and it is common at all ages from birth to senescence. One attack does not confer immunity. In fact, one attack sometimes lasts throughout the cold season, during which time there may be as many as four or five acute exacerbations.

Importance

TO THE business world, as well as in family life, this is one of the most costly sicknesses known. It is by far the most common cause of absence from school or work. The loss of time is enormous, and complications and sequelae are devastating. Practically all of the chronic changes in the structure of the nose, ears, sinuses and throat are the result of an acute attack, or repeated attacks, during the early years of life. Chronic infections, serious illness affecting vital organs, in particular the heart and kidneys, may follow the acute infection. The appendix is composed of the same kind of tissue that composes the tonsil, and it is not unknown to have an epidemic of appendicitis after an epidemic of colds, especially in schools where a large number of people are housed under the same roof.

Every possible precaution should be taken to prevent the common cold. This is not simple, for there are many factors involved. Once the physiology of the nose and throat becomes disturbed, they are susceptible to infection by the ever-present germs. There is an old, but true, equation for the common cold as follows:

Susceptibility, + exposure, + infection = a cold.

Nature of a "Cold"

LET US consider the significance of this equation briefly, and I think we can show that this malady, designated as the "common cold," is primarily a physiological disorder, and that germs or viruses play a secondary role. In fact "infection" is, as the equation indicates, the third factor.

What does the author mean by the first factor in the equation, — susceptibility? In the premise I said "The functions of the body are marvelously balanced products of various physiological activities;" and if the normal balance of these activities is disturbed, a pathological condition is the result; and so susceptibility means that the normal physiological activity of the various tissue cells has been put out of gear, and as a result the normal functions are temporarily impeded. When this affects the body chemistry, it does not take very long for a toxic state to develop.

It is my opinion that those individuals who are refered to as "cold susceptibles" are merely the victims of errors in the daily routine. Through dietary errors and excesses, and neglect of the laws of personal hygiene, their cells and tissues are filled with "fatigue stuff," and the capillary vessels are contracted and the circulation is slowed down. In short, they are in a more or less chronic state of susceptibility, and a ready prey for "exposure,"—which is the second factor in the "cold" equation.

There is always a short prodromal period at the onset of this physiological upheaval. This may be a few hours or several days. One notices that the digestive functions are not normal; the bowels become irregular; the digestion is "finicky;" and the taste of food is not normal. All of this is the result of faulty digestive processes and incomplete metabolism and vitamin deficiency. The tissue cells are loaded with by-products, and an insufficient supply of oxygen reaches the cells. The alkaline-acid balance of the blood is off toward the acid side. The skin heat radiation is not normal, owing to contraction of the skin capillaries, resulting in abnormal sensitiveness to cold and drafts.

Next comes the local phenomena in the naso-pharyngeal mucous membrane. The nose is dry, and there is irritation of the pharynx, characterized by soreness behind the soft palate. The capillaries of the throat are contracted; and the normal secretion of the nose is absent. The body temperature is lowered; and germs or viruses, what you will, now find the conditions to their liking, and "infection" starts.

Prevention

FIRST, what can one do to prevent this susceptibility? And, second, what should be the immediate treatment of the acute physiological syndrome? The answer to the first question is, "keep fit," which means—adjust your daily routine so that the physiological processes function normally at all times.

The first step in this direction is to correct dietary deficiencies and indiscretions. Many "susceptibles" have vitamin deficiencies. Eliminate from the diet sugar, candy, cakes, pies, jams, all starches except potato and rice. Eat the darker breads in place of white bread. For sweetening, use honey. Avoid alcoholic excesses. Sugar and alcohol use up the vitamin "B_1" of the blood stream very rapidly, so be sure that the diet is at all times high in foods having natural vitamin B_1 content. A suitable diet for "cold susceptibles" consists of fruits and fruit juices, milk, cream, butter, eggs, all vegetables and salads, meat, fish and fowl, gelatin, and cream puddings; and honey or saccharin for sweetening. Rye bread and bread made from soy bean flour are more desirable than wheat. Take plenty of cream or milk in coffee. Vitamin B_1 may be added daily. Any known allergy to food should be respected.

Treatment in the Early Stages

IN REGARD to treatment of the acute syndrome, —when you feel that a cold is coming on, take a cathartic which cleans out the entire alimentary canal. Magnesium hydroxide (milk of magnesia) is ideal for this purpose, for it is anti-acid as well as laxative.

Apply hot fomentations to the entire face. An ordinary washcloth wrung out in water as hot as you can tolerate it will answer. Do this for five minutes every hour. This dilates the capillaries of the face and mucous membrane of the nose, stimulating the local circulation. Gargle throat at the same time with hot salt water. A general hot bath is in order if possible.

Any local applications to the nose or throat at this stage should be stimulating and germ-resisting in order to further dilate the capillaries, and stimulate the secretions which have an inhibiting action on bacteria; menthol and eucalyptol in albo-

lene is a beneficial nose application. At the onset of the common cold avoid local remedies which contract the capillaries, such as argyrol and ephedrine often used without advice.

Quinine, a drug that was greatly respected a generation ago but has slipped into discard of late, is most useful at the onset. The action of quinine is well known. It possesses some anti-virus and germicidal properties, and counteracts the contraction of the blood vessels in the naso-pharyngeal mucous membrane through its vaso-dilating properties, thereby increasing the circulation and secretion of this membrane. Quinine also promotes excretion from the blood of some of the acid by-products of metabolism. Five grains of quinine hydrochloride is the dose,—repeat in four or five hours. Some individuals are sensitive to quinine and cannot touch it, and they should, of course, omit this.

Restrict the diet to fruit juices abundantly, take plenty of water, and avoid acid-forming foods especially hard cereals and sweets. Take milk, cream, eggs, fresh vegetables and fruit. Supplement the diet with some standard preparation of vitamin B_1 in full doses and avoid alcoholic drinks.

The Fully Developed Cold

IF A COLD has developed, keep at home, and stay indoors,—in fact in bed for 24 hours. Sleep in a well-ventilated, but warm, room. Under no conditions should anyone be about with a cold if there is a rise in temperature above normal; and by the same token, if the temperature is subnormal as it may be, one is easily chilled, and exposure may produce serious consequences. Subsequent treatment depends on the symptoms.

A cold morning bath with a hard rub, and a few minutes of exercise in the open, and deep breathing, will help keep the skin capillaries active and raise resistance to exposure. Infected tonsils, sinuses, and nasal obstructions are commonly the cause of frequent affections of the nose and throat, and they should be corrected; but that is something else and has nothing to do with the subject under discussion.

Preventive Vaccines

IT WAS my experience when I was at the Stock Exchange, where there was an opportunity to observe large groups of people, that those individuals who had taken vaccine showed better resistance against cold complications than those not vaccinated; and for this reason I would recommend protection of this kind during the winter season.

In regard to immunity in general,—it is a well known fact that there are some species in the animal kingdom who enjoy natural immunity to infection by germs. The explanation of this is that the living cells and certain body fluids of such animals possess the power of destroying the life of the germs, or of neutralizing their poisons. Some individuals seem to be born with a degree of natural immunity, or they build up resistance through adequate nutrition, and while they may contract some forms of infectious diseases, they are able to overcome them with minimal damage. It is also likely that one may acquire immunity through exposure to small doses frequently. Such individuals possess actively functioning cells and tissues, as the result of which they are not susceptible. I firmly believe that individuals who keep physically fit and whose bodily functions operate effectively have a natural protection against all bodily diseases, including infectious diseases.

The Special Nature of Industrial Practice

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INDUSTRIAL practice remains largely surgical, even today, in spite of much talk of disease prevention and health promotion.

When DR. CARL M. PETERSON, Secretary of the Council on Industrial Health, very kindly asked me to prepare a paper on "The Special Nature of Industrial Practice," he said that for some time there had been need for discussion of certain remarks concerning medical relationships in industry, as presented by the Council on Industrial Health in the February 17, 1940, edition of *The Journal of the American Medical Association.* He indicated also that the presentation of such a paper might arouse discussion regarding the necessity for specialization in that field and would clarify the atmosphere a good bit

The quotation specifically referred to is as follows, (p. 31, reprint on "Industrial Health"):

> "Industrial health as practiced today is not a restricted field. In this respect it resembles all other special provinces of medical interest. Physicians engaged in industrial practice in a limited way believe that any one with good basic medical equipment can successfully conduct an industrial practice with certain adaptations which are to be gained largely through experience. A contrary point of view is expressed by those engaged in industrial practice full time, who state that industrial health requires a degree of preparation on the part of those who elect to serve therein quite as exacting as to be found in any other specialty. Furthermore, they contend that successful industrial medical specialization demands additional proficiency, mainly in the field of administrative practice.
>
> "Obviously, the educational requirements for these two groups are dissimilar; but, if growing demands on the profession are satisfactorily to be met, most practitioners will need some training in industrial health to establish competence and some practitioners will need a great deal in keeping with the varying situations and circumstances under which industrial practice occurs."

With respect to the present status of industrial practice, the following quotation is taken from a paper by DR. MORRIS FISHBEIN entitled "Industrial Health and the General Practitioner," as given before the first American Conference on Industrial Health, on November 14, 1940, (published in INDUSTRIAL MEDICINE, December, 1940, p. 631):

Presented at the Third Annual Congress on Industrial Health, American Medical Association, Chicago, January 13, 1940.

"As a part of its effort for the national defense, the American Medical Association has sent a questionnaire to every physician in the country to determine his availabilities for military or other services. More than 175,000 physicians have been queried and more than 120,000 replies are already at hand. It is apparent from the replies that have been received that there are probably less than 5,000 physicians in the entire United States who can qualify as specially competent in the field of industrial medicine. Moreover, a second questionnaire was sent to 3,544 persons who indicated special competence in industrial medicine. At once 495 replied to the effect that they were not industrial physicians. Only 1,283 physicians especially qualified in industrial medicine could be recorded as actually competent in the field."

It can thus be seen statistically that 0.01% of the 120,000 physicians replying were thought actually competent in the field of industrial medicine, by the American Medical Association.

In considering the special nature of industrial practice, we are quite naturally concerned about the differences between private practice and industrial practice. These differences have been discussed, but it is essential to the line of reasoning used in this paper that they be mentioned again.

THE employer-employee relationship and all that it signifies is the one important factor that distinguishes industrial practice from private practice. And in turn, that relationship brings to the industrial scene a lot of other persons, such as industrial nurses, industrial hygienists, chemists, medical specialists of various types, safety engineers and also other engineers of different kinds, insurance men, legislators, courts, commissions and boards, and attorneys, all of whom are vitally interested in the same objectives—health promotion and health supervision in industry.

Although there are difficult sociological and administrative problems arising because of widely varying relationships in industrial practice, this paper will deal more specifically with the simple technical and professional differences. Of these, may be mentioned etiology, examinations, diagnosis and differential diagnosis, medicolegal aspects, and health supervision procedures in industry.

Etiology is one of the subjects that apparently becomes a considerable problem for the private practitioner who accepts industrial cases. In the private practice of medicine, the history is of great importance and gives leads as to the necessity for certain diagnostic and laboratory procedures. The same is true in industrial practice, with this important exception, however, that the etiology lies in an industrial environment and therefore, deserves special consideration, which comes within the purview of industrial hygiene surveys.

It is not expected that the private practitioner will be professionally competent to do, for example, an investigation covering the technical aspects of dusts, gases, vapors, and fumes in industrial occupations, nor do illumination or ventilation tests; it is expected, however, that if he is to arrive at any sound conclusion with respect to the etiology of an occupational disease, he must take such factors into consideration. One would also feel that he should be able to take a thorough history of industrial occupations which would be of real value, so that it would indicate what points might be important in the diagnostic and laboratory methods to follow.

The most common error is the use of *post hoc ergo propter hoc* reasoning. Statements made by patients during history taking are accepted at full face value as to their etiological significance. As examples, it is assumed that because of mere contact with lead or with free silica, the actual hazards of disease existed, and that the employee could have contracted the diseases of lead poisoning or silicosis. Such assumptions have produced a fallacious trend of thought, interfering with the proper application of scientific diagnostic and laboratory methods.

Examinations of every kind have, of course, been made.

These include the mere inspection, the detailed examination, and the examination that is scientifically painstaking. For some time we have contended that when examining employees for industrial work, if the physician expects to do a good job on his pre-employment and periodic examinations, he should know several things:

1. The nature and and severity of the industrial exposure where the employee is going or has been (the physicain should know this when he makes his examination or he cannot make a very intelligent appraisal);

2. Whether that exposure is adequately controlled or represents a health hazard—if the latter, whether supplementary protection can be or has been provided; and

3. Whether the examinee possesses any defect or abnormal condition which might be adversely affected by the employment, or might of itself cause disability or incapacity.

Moreover, there must be special examinations for different types of exposure—one would not do the same kind of examination for a man going into a known dust exposure as he would for an employee going into a known lead exposure. It seems obvious that until we can make our examinations more specific and more industrial in type, we cannot expect that the results will be specific.

Diagnosis and differential diagnosis in occupational and non-occupational affections among industrial employees has come to be a very difficult thing both for private and industrial practitioners. There are a number of instances in which well-known occupational maladies simulate non-occupational sicknesses and contrariwise. It is of the greatest importance that the etiology be taken into consideraiton both when making the diagnosis and considering differential diagnosis—for there must be a causal relationship between the industrial environment and the disease if the illness is to be directly ascribed to industrial factors.

In short, when considering etiology, diagnosis and differential diagnosis in industrial employees, it certainly is true, as one of my friends used to say rather ungrammatically but forcefully, "you have to know what to look for."

HEALTH supervision methods in industry are of unusual type when compared with the common curative practices of medicine and surgery. Reference is here specifically made to periodic health examinations, supervision of the correction of physical defects, and first aid to illness in the industrial dispensary.

For many years there have been those who have contended that a health examination is a thing apart from the usual practice of medicine; conservatively speaking, it is something rather different from the usual physical examination done either by the private practitioner or the industrial physician, in many instances.

The supervision of the correction of physical defects is the second important member of the triad of health supervision procedures, and is vital to the continued health of the employee. It is not expected that the industrial medical staff shall do the correction of physical defects, which should be referred to the private practitioners, but rather, it is expected that it shall follow up the industrial employee and see through proper arrangements that correction is finally done.

The practice of first aid to illness in industrial dispensaries has been a mooted question for years. Suffice it to say briefly that the majority of industrial employees do not go to their private physicians for headache, constipation, colds, periodic disturbances, and the like, which make up the most of these sickness first aid calls in any industrial dispensary. It should now be conceded that such practice, without actually carrying treatment further, is within the scope of industrial health work.

Nowhere in the field of industrial practice is the test of scientific application so great as in medicolegal problems. For it is here that the physician and surgeon must prove his contentions and establish his proof by the judicious admixture of scientific data with common sense. Here is applied real cause-and-effect reasoning through the detailed consideration of medicolegal technicalities, which must rest upon a background of thorough records and investigations. Here indeed is the application of scientific industrial medicine.

As examples of lack of proper application of special knowledge in recent personal experiences with industrial practice, the following may be cited:

1. The practical difficulties in finding plant physicians to properly guide medical and health departments in industry, because such candidates usually do not possess average knowledge of the problems to be encountered.

2. The personality disturbances experienced in trying to get surgeons to do periodic re-examinations among industrial employees, as a part of industrial health programs.

3. Mistaken diagnoses found on hospital and clinic records in well recognized institutions.

4. The signing of death certificates without adequate knowledge of primary and contributory causes of death.

5. Peculiar and bizarre findings in the reports of specialists, including internists, pathologists, toxicologists and roentgenologists, in industrial cases.

6. The appointment of special medical commissions by various state departments for the specific purpose of examining disputed industrial cases and constituting the last resort as to medical opinion—when such appointees have no special knowledge nor experience in industrial medicine, but have been chosen rather for their reputations in general and special medicine. Such boards have been protected by law from being questioned as to the reasons for their findings.

GOOD medical work has been and should be applied to industry—but good medicine is not necessarily good industrial medicine. One must be something besides a good doctor to be a competent industrial physician.

How shall these conditions be remedied? The obvious solution is to bring the specialized knowledge to those who need it. The Council on Industrial Health is already at work considering various methods of making available such specialized information both to general and special practitioners, in private work.

The outlook for post-graduate and undergraduate medical education through courses on industrial health, medicine and hygiene is not altogether promising. It will probably take a whole generation to provide the necessary number of properly and adequately educated persons, after first building up the required teaching staffs.

There is neither time nor space to describe the courses of study in detail — those can best be thoughtfully planned by the Council on Industrial Health and the Council on Medical Education. However, the work should include properly adapted material on industrial sociology and psychology, industrial health administration, industrial safety, and industrial hygiene engineering—as well as the medical fundamentals.

It is quite possible that the defense program will give some impetus and favorably affect the development of better methods, as well as provide training for a larger number of persons. A real defense program means not only the production of armaments, but building men and women of the nation into healthy, strong individuals, fit to make and handle the defense machinery.

Meanwhile, both general and special practitioners in various lines must depend upon those who are specifically informed; the American Medical Association is now collecting data, for example, regarding industrial hygiene laboratories and their locations throughout the country. Such a list is to be published so that availability will be known.

The Council on Industrial Health is to be congratulated on the work already done and with respect to its attack on the tremendous problems of the future. It is suggested that the Council could probably exercise favorable influence through the county and state medical societies, particularly with reference to the appointment of competent personnel on medical boards attached to the state departments of labor and industry, and also in the appointment of consultants to industrial commissions and boards.

One point stands out clearly—when the medical directors of large plants (who certainly know a great deal about industrial health problems) make use of specialists in the field of industrial hygiene, health, and medicine, certainly the private practitioners and private specialists would do well to consider such sources of necessary technical information.

Finally, let us go back to fundamentals—the physician in his consideration of the industrial employee has concentrated on the man; it is important that every physician who serves industry in whatever capacity know more than the man—the physician must have some knowledge of the principles of management, and of materials, methods and machines.

Dental Program in Industry

ERNEST W. MILLER, M.D.,
Chief Surgeon, Milwaukee Electric Railway & Light Company, Milwaukee, Wisconsin

YOU may wonder, as I did, why a medical man should be asked to present a dental subject to you. After several months of investigation, I believe I have the answer. There has been so very little done in this field by the dental profession itself (and this is no criticism of that profession) that I feel quite certain your general chairman could find no one else to undertake it. I, therefore, feel more highly honored in being asked to appear before this group and shall endeavor to relate, quite largely, my own experience in developing a dental program in an industry.

IT MAY be wholly unnecessary in a gathering such as this, to relate the conditions which might prompt a dental program in any industry. The old saying "We dig our graves with our teeth" does not apply in this instance. The internist and especially the gastro-enterologist, should be consulted on this phase of the problem. There are, however, many conditions which have a deleterious effect on the health, happiness and well being of an individual engaged in industry, who is a sufferer from any one of the numerous afflictions the dental structures may make us heir to.

It may truly be said that a large number of conditions which come to the attention of the internist or gastro-enterologist are primarily the result of some dental pathology. Needless to say the theory has long prevailed that much of our gastric pathology, as well as gall-bladder disease and even the common appendicitis, may be attributable to a focus of infection in the mouth. We are all quite familiar with the joint infections, rheumatic fever and cardiac conditions which can be readily traced, in part at least, to some dental pathology.

So far as the industry is concerned I shall cite just one case which describes so thoroughly the latent result of dental infection. I have in mind a skilled mechanic who quite suddenly became afflicted with an eye condition which rendered him totally disabled so far as his work was concerned for a long period of time. He was treated by an oculist with uncertain results, was seen by an internist with no improvement, and ultimately the removal of one infected tooth completely relieved the eye condition so that the individual could again assume his place as a productive unit in the industry.

There are so many cases of a similar nature which might be cited to bring home more forcefully the possibilities which may arise as a result of neglected dental pathology. This discussion, however, is apart from the subject at hand.

I MIGHT discuss a dental program in the industry from a highly theoretical point of view, which would be the ideal situation, could it be attained.

In so doing I would advocate a more widespread education by the dental profession so that the dental program begins very early in the life of every child and is carried through periodically for the entire span of his years. Were such a plan developed there could be little left for any program in the industry. At present the average applicant for employment in industry has reached an age of at least 18 years and in the event of dental neglect during his period of years prior to such application, he comes to the industry as a rather pathetic picture so far as his dental status is concerned. His or her natural resistance has been sufficient to withstand the conditions up to this time, but little does he realize what the future may hold for him.

It may be said that a dental program could be instituted at this point and in the course of physical examination for employment, which is now accepted and approved by the Industrial Commission of our state. Applicants might be deferred for employment until proper dental care has been given. This is highly impracticable and, in my opinion, cannot be done.

We must, therefore, look to some other plan for a solution. The examination at the time of employment could be supplemented in the form of x-ray examination, translumination and observation, merely as a matter of record with the hope that in the near future, full attention would be given to the conditions found. Any such undertaking must necessarily require an extensive educational program. The reasons for such examination should be cited to the individual and a rather detailed description of the processes which may originate and be nurtured and cultured in the mouth, be outlined. Such a plan could be further supplemented by regular six- or twelve-month re-examinations to determine what, if anything, had been done to relieve the conditions found at the time of employment.

Further educational propaganda should be carried on to counteract to some extent at least, the rather radical radio programs which are being

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Presented at a Symposium on Industrial Public Health Nursing Services, Milwaukee, February 20, 1941.

foisted on the listening public, day in and day out, concerning preparations for the beautification of facial features. I believe it is well known that many widely advertised preparations can be injurious to certain individuals.

In this connection the subject should be given consideration with regard to the chemical reaction which is set up in the mouth and varies greatly in almost each instance.

Such a program as outlined is extremely broad and would, in my opinion, require the wholehearted support of the entire dental profession to accomplish the result which one would like in return for the efforts expended.

THESE various problems involved in a dental program in the industry have been carefully considered by me for a period of more than 20 years. About that many years ago, as Chief Surgeon of the Milwaukee Electric Railway & Light Company and Medical Director of the Employees Mutual Benefit Association, I realized the great advantage to be derived by the employed personnel of any company through some form of organized dental care. In conference with the then president of the American Dental Association, we discussed at length the possibility of the organization of an Industrial Dental Clinic. As I recall, it was in 1921 that such an organization was developed with the hearty support of the president of the American Dental Association and various industries were encouraged to assist in making this clinic a success.

It was suggested to the members of our Benefit Association that they might avail themselves of the facilities of this clinic with the assurance that the dental work furnished would be of an extremely high character and that the costs would be on the basis of an overhead plus a small percentage, I believe it was 10%. This undertaking was short-lived and if my memory serves me correctly, the clinic operated for a period of 18 months to two years and closed its doors for want of patronage.

With the added interest which had been instilled in me through this undertaking, although a failure financially, I quite immediately concluded that when and if an industrial dental organization could be instituted in connection with the medical department of which I was, and still am, the director, I should undertake the organization and development of such a clinic, for our employees.

After diligent search, a member of the dental profession was found who had an unusual interest in this kind of work and he undertook to cooperate with me in the organization of the clinic, which has now persisted for about 17 years.

With absolutely no personal experience to guide us and no experience of others to assist, we groped about somewhat in the dark. It was our aim to furnish the very best dentistry that could be secured, including the very best of materials and to attract patronage of employees by the character of the workmanship and the high grade of materials used. The undertaking apparently has been successful, inasmuch as there came shortly a very strong insistance on the part of the employees that their wives and children be able to avail themselves of the same service. We accepted the wives and have thus far excluded the children, which as stated earlier in this paper, was undoubtedly a mistake, particularly from a theoretical point of view. However, I am convinced that dentistry for children is a rather highly specialized field and more or less difficult to handle. Could we have assumed that the children of today would be *our* employees of tomorrow, it would have been wiser to render dental service to them at the very earliest possible moment.

The dental department of our organization operates as any private dentist's office. Appointments are made and the work is done in a manner identical with that of other dental offices. There is absolutely no restriction placed upon us by the management, and it is necessary to render service on a very high plane in order to stimulate continued interest.

I have also felt that the same conditions prevail in dentistry as in medicine, namely, that the wider the scope of service rendered the more satisfactory the outlook. Our dental department, therefore, not only undertakes, but does all kinds of dental work, with the exception of highly specialized types, which it seems inadvisable to do.

I feel certain that the next question to answer is the cost to the individual for a program of this character. We did not attempt immediately to establish any fixed prices or costs. We felt that experience alone could give us this information. By carefully analyzing the overhead, we very shortly were able to determine approximately what must be returned from a dental chair in order to make both ends meet. We felt at the outset that we could furnish to the employees of our industry, dentistry of the highest type at approximately 50% of the cost of comparable dentistry in a privately operated dental office. This opinion was based upon the review of the expenses for rent, light, heat and permanent equipment; these items being furnished by the company. After several years of operation of the clinic, it was found that these assumptions were very true and, over the period of years, the costs to the individual have not increased, but in fact have decreased, notwithstanding that the remuneration to the dentists has been quite substantially increased.

AFTER about 10 years of operation, it was found that the service of a dental hygienist could be most valuable. The value of our dental hygienist has been materially enhanced through the years of her service. It seems that in many fields the female of the species is much more adept for details than the male, and in my opinion the duties of a good dental hygienist are made up quite largely of the more uninviting details of the dental business.

Our organization at this time, comprises three dentists, one dental hygienist and two dental clerks, who are very capably used as assistants to the dentists themselves.

What I have told you I hope has given you my

impression of the great necessity for introduction of dentistry at the outset of life; how, theoretically dentistry should begin in industry at that time and be continued through the whole period of one's life, thereby eliminating the necessity of any so-called dental program in industry.

In the absence of such a millinneum in dentistry, the second proposal, somewhat of a theoretical nature too, including dental examinations at the time of employment and six- or twelve-month re-examinations, could scarcely be called an adequate substitute, but would be a step in the right direction.

Were it possible to refer an employee or all of the employees of any given industry to the dentists at large in that community with the knowledge that everything possible would be done for these individuals at a reasonable cost, I am certain that the dental profession could be in a much more happy position than they may be at this time.

All of these things failing, as they appear to have failed, I am thoroughly convinced that it is within the bounds of propriety for any industry to make available to its employees, dentistry of the highest character at the lowest possible cost, under a plan such as I have described.

Industrial Health

—Abstracts of Papers given at the Third Annual Congress on Industrial Health of the American Medical Association and the Chicago Medical Society, January 13, 14, 15, 1941, Chicago—

THE Third Annual Congress on Industrial Health as sponsored by the Council on Industrial Health of the A.M.A. was held at the Palmer House, Chicago, January 13 and 14, 1941, with other sessions arranged on Wednesday, January 15 (see program) by the Chicago Medical Society and also the Joint Committee on Industrial Dermatoses of the Section on Dermatology and Syphilology of the A.M.A. and of the American Dermatological Association.

The complete and original program follows:

MONDAY MORNING—STANLEY J. SEEGER, M.D., presiding.

Report of the Council on Industrial Health—STANLEY J. SEEGER, M.D., Chairman, Milwaukee.

The Physician in Industry and National Defense—IRVIN ABELL, M.D., Chairman, Health and Medical Committee of the Council of National Defense, Louisville, Kentucky.

Current Needs in Industrial Hygiene Research—PHILIP DRINKER, Professor of Industrial Hygiene, Harvard University, Boston.

The Special Nature of Industrial Practice—C. O. SAPPINGTON, M.D., Dr. P. H., Industrial Hygiene Consultant, Chicago.

Disability Evaluation in Silicosis—J. L. BLAISDELL, M.D., Porcupine Clinic for Silicosis Research, St. Mary's Hospital, Timmins, Ontario.

Hand Injuries

MONDAY AFTERNOON—CLARENCE D. SELBY, M.D., presiding.

Anatomic Diagnosis of Injuries of the Hand—JAMES M. WINFIELD, M.D., Associate Professor of Surgery, Wayne University College of Medicine, Detroit.

Treatment of Superficial Hand Injuries and Burns—HARVEY S. ALLEN, M.D., Clinical Assistant in Surgery, Northwestern University Medical School, Chicago.

Division of the Nerves and Tendons of the Hand—MICHAEL L. MASON, M.D., Associate Professor of Surgery, Northwestern University Medical School, Chicago.

Importance of Purposeful Splinting Following Injuries of the Hand—HENRY C. MARBLE, M.D., Boston.

Prevention and Treatment of Hand Infections—SUMNER L. KOCH, M.D., Associate Professor of Surgery, Northwestern University Medical School, Chicago.

Availability of Trained Industrial Health Personnel

MONDAY AFTERNOON—LEVERETT D. BRISTOL, M.D., presiding.

The Industrial Nurse—RUTH HOULTON, R.N., Secretary, Industrial Nursing Section, National Organization for Public Health Nursing, New York City.

The Industrial Hygiene Engineer—WARREN A. COOK, President, American Industrial Hygiene Association, Chicago.

The Safety Engineer—W. H. CAMERON, Managing Director, National Safety Council, Inc., Chicago.

The Medical Industrial Hygienist — PAUL A. NEAL, M.D., Chief, Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Bethesda, Maryland.

The Physician in Industry—ROBERT T. LEGGE, M.D., University of California, Berkeley, California.

TUESDAY Morning—HENRY H. KESSLER, M.D., presiding. Employment of the Physically Handicapped—D. L. LYNCH, M.D., President, American Association of Industrial Physicians and Surgeons, Boston, Mass.

Aging as a Problem of Industrial Health—EDWARD J. STIEGLITZ, M.D., Research Associate in Gerontology, National Institute of Health, U. S. Public Health Service, Bethesda, Maryland.

Acute Respiratory Disease in Industry

Incidence and Costs of Acute Respiratory Disease in Industry—ANTHONY J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York City.

Respiratory Disease and Air Conditioning—CAREY P. MCCORD, M.D., Chairman, Committee on Air Conditioning of the American Medical Association, Detroit.

The Role of the Physician in Industry in the Control of Acute Respiratory Disease—GEORGE M. PIERSOL, M.D., Philadelphia.

Industrial Ophthalmology

TUESDAY AFTERNOON—HARVEY BARTLE, M.D., presiding.

Economic Importance of Visual Disability in Industry—LEONARD GREENBURG, M.D., Chairman, Industrial Advisory Committee of the National Society for the Prevention of Blindness, New York City.

Essentials of First Aid and Later Management of Industrial Eye Injuries—SYDNEY WALKER, JR., M.D., Chicago; and HANFORD L. AUTEN, M.D., Chicago.

Detection and Control of Defective Vision in Industry—ARTHUR M. CULLER, M.D., Dayton, Ohio.

Protective Equipment for Eyes in Industry—THOMAS D. ALLEN, M.D., Associate Clinical Professor of Ophthalmology at Rush Medical College, Chicago, and HENRY F. CARMAN, M.D., San Francisco.

WEDNESDAY—Clinics and Demonstrations in Industrial Medicine, Hygiene and Traumatic Surgery arranged by the Chicago Medical Society and the Carnegie-Illinois Steel Corporation, South Chicago, Illinois, and Gary, Indiana (DR. PHILIP KREUSCHER and Associates) on the following: Treatment of Fresh Wounds; Treatment of Burns (motion picture); Fracture Management; Prevention and Management of Heat Sickness; Prevention and Treatment of Carbon Monoxide Poisoning; Demonstration and Discussion of Safety Methods; Plant Inspection.

WEDNESDAY MORNING—Clinic and Symposium on Industrial Dermatoses — FRANCIS E. SENEAR, M.D., presiding.

Criteria for diagnosis, diagnostic technics and demonstration of patients arranged with the assistance of the Joint Committee on Industrial Dermatoses of the Section on Dermatology and Syphilology of the American Medical Association, and of the American Dermatological Association.

WEDNESDAY AFTERNOON — Symposium on Occupational Diseases, LLOYD L. ARNOLD, M.D., presiding.

The Industrial Hygiene Survey—An outline of tested procedure to detect and evaluate industrial health exposures, adaptable to both large and small plants—K. M. MORSE, Industrial Hygienist, Illinois State Department of Public Health, Chicago.

Principles of Control over Industrial Health Exposures —a description of progressive steps necessary to control industrial health exposures—DONALD E. CUMMINGS, Director, Division of Industrial Hygiene, University of Colorado School of Medicine and Hospitals, Denver.

Pitfalls in Occupational Disease Diagnosis—discussion of ways in which occupational intoxications simulate other diseases, with emphasis on differential diagnosis—M. H. KRONENBERG, M.D., Chief, Division of Industrial Hygiene, Illinois State Department of Public Health, Chicago.

Occupational Disease Testimony—instruction for the physician in effective presentation of medical testimony on occupational diseases before workmen's compensation administrators—JAMES J. MCKENNA, Chicago.

DINNER and Evening Program:

Industrial Health—A Medical Opportunity—STANLEY J. SEEGER, M.D., Chairman, Council on Industrial Health, American Medical Association, Milwaukee.

Medical Service for the Small Plant — ANTHONY J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Co., New York City.

The Control of Syphilis in Industry—HAROLD A. VONACHEN, M.D., Medical Director, Caterpillar Tractor Company, Peoria.

Monday Morning Session

DR. STANLEY J. SEEGER, the Chairman of the Council on Industrial Health, in giving his report of the council, stated that the council previously undertook to define health hazards in industry. The first congress held in 1939 was an exchange of viewpoints of different groups, both official and nonofficial agencies. The result was a quickening of interest in industrial health.

Emphasis has been placed on the number of workers under the care of private practitioners. For instance, 97% of the industrial groups in this country are comprised of less than 250 employees. It must be pointed out that small plant groups are as yet unexplored as to health problems.

The council must be prepared to act as a clearing house through its nonmedical contacts. It must be cognizant of nonofficial agencies and the importance of the coordination of community resources. In closing, DR. SEEGER quoted Dr. Morris Fishbein, who says that all medical men should work together as colleagues in this great and important problem of industrial health procedures.

DR. IRVIN ABELL spoke on "The Physician in Industry and National Defense."

The successful outcome of military activities depends upon the proper coordination of various resources. The medical profession must be prepared for health maintenance programs in industry. Lost time must be regarded as comparably important to casualties.

Of the industrial health agencies who participate in these programs, it is of particular importance that they know what is to be done and the important lines of attack on the problems.

The Council on Industrial Health believes that it can render material assistance on the following items: (1) locations of new plants; (2) the recognition and control of hazards; (3) fatigue studies; (4) the proper adjustment of handicapped persons; (5) health service facilities; (6) physical examination programs; (7) classification and training of personnel; (8) classification of educational institutions; (9) preparation and distribution of information on toxic problems in industry; (10) and establishing the principles of programs of control of communicable diseases.

The work of the Committee on Medical Preparedness was mentioned in its relationship to the medical profession.

The American Medical Association has classified physicians with respect to the nature of the practice which they are doing. Questionnaires have been sent, and through the information gained, there can be direct application for the programs of the civil, industrial and military groups.

Physicians in industry should not be assigned to strictly military service unless there is obvious necessity and emergency. Short intensive courses should be given for other physicians, while other professional men will develop through experience and training.

The medical profession is in a better position now than it ever has been to adapt itself to the present situation. A subcommittee has been appointed and is busily engaged in working out a survey of physicians with respect to ability, and to availability for training, as well as problems for protection against hazards and necessary studies of environmental sanitation.

An increase in the number of properly qualified men can be accomplished. It is of importance to realize that industry is equal in value as compared with combatant forces.

PROFESSOR PHILIP DRINKER, discussing "Current Needs in Industrial Hygiene Research," laid emphasis on the fact that the navy is the largest manufacturer in business, with the army a close second. There are many production problems arising and such will continue to arise. If production is slowed down, the industrial hygienist will be blamed.

If a list could be obtained of the different problems, the work of the industrial hygienist would be greatly facilitated. In this connection, the quotation of General Fries at one of our meetings last June is very important —the substance of the statement was that the nation uses what it has at hand, in an emergency.

It is believed that there will be new problems and old problems on a scale unbelievable—we are not to minimize the latter.

Reference was made to the volume of Henderson and Haggard on "Noxious Gases" particularly with respect to the laws of gases and vapors and their reactive powers in the blood.

No one need now give any excuse for the ventilating problems with respect to the hazard of carbon monoxide, because the fundamentals are now well known.

It is also true that the nitrogen and helium absorption studies have permitted diving in excess of 200 feet, which was the principle that permitted the salvaging of the Squalus.

Information is, however, greatly lacking with respect to various problems relating to the use of toluol. A great deal of work will need to be done in order to put our knowledge on a scientific basis.

Benzol, however, can now be used safely and in this connection, Schrenk's work with the Bureau of Mines was mentioned as being outstanding. Benzol will continue to give trouble, however, if it is not handled properly.

Acetone is another substance which is important in explosives manufacture and it has much the same effect on the body as ethyl alcohol. Additional work, of course, needs to be done on this substance.

Selection of materials should be on the basis of (1) war and peace time uses; (2) physical and chemical properties; and (3) toxicity.

There is a great need for a technique for the detection of small amounts of substances in the blood and other fluids, and particularly with reference to the possibility of reporting such findings in micrograms per cc. of blood.

Nor is it out of order to demand better and more rapid methods of measurement of vapors in air.

In contested claims, it would be of great advantage to use blood samples on men who had been exposed to duplicated conditions, but we are not prepared to use such information at the present time. Incidentally, blood samples are difficult to get from employees, but urine samples are relatively easy.

Furthermore, studies of vapor concentrations in these various problems will be of great help to industrial physicians. A case in point was described with reference to exposure to sulphur dioxide in an employee who had previously contracted tuberculosis. It was claimed that the exposure induced coughing and activated the tuberculous process. An adequate answer to such situations can be gained through animal experimentation. Definite relationship should be established between pulmonary irritation and infection, or the lack of such relationship.

Dermatitis remains a challenge to the industrial hygienists. Tradenames should be prohibited unless the true composition of the various trade substances is given.

Silicosis research by Gardner has already been well done and only brief mention can be made of this phase of industrial hygiene. It is now possible to make dust injections in specific problems to find out what the reaction is. The question is always whether a mixed dust or any specific dust in question will do what free silica or asbestos will do. The results of the Canadian experience with aluminum compounds as protective media will be awaited with great interest; further work is being done with respect to the application of this principle with industrial groups.

Of late, welding processes have been greatly emphasized. Extensive experience shows that no hazard exists in well ventilated areas, but it is a dangerous operation in confined spaces.

In closing, the speaker stated that he purposely omitted the hygiene of explosive manufacturing because of the lack of information necessary at the present time.

COMMANDER CHARLES S. STEPHENSON of the U. S. Navy Medical Corps gave a brief discussion of Prof. Drinker's presentation, stating that in the navy, which is a big concern, they attempt to apply ordinary knowledge in the medical group. It should be appreciated by all physicians that when industrial poisoning takes place, prevention has failed. We must now realize that the general practitioner must do most of the work done on industrial employees.

DR. C. O. SAPPINGTON presented the subject "The Special Nature of Industrial Practice."

Industrial practice remains largely surgical, even today, in spite of much talk of disease prevention and health promotion.

Recent statistical data acquired by the American Medical Association in answer to questionnaires sent to industrial physicians shows that only 1283 physicians can be recorded as being actually competent in the field of industrial medicine, out of 120,000 replies to questionnaires which were sent.

The employer-employee relationship and all that it signifies is the one important factor that distinguishes industrial practice from private practice. This relationship, however, brings to the industrial scene a great number of other persons who are responsible for various phases of the work and with which the physician must have proper contacts and understanding, if good results are to be obtained.

Etiology, employment and periodic examinations, diagnosis and differential diagnosis, medicolegal aspects, and health supervision procedures in industry constitute the most important problems.

Etiological relationships embrace the necessary use of industrial hygiene information, which the private practitioner is not expected to have knowledge about, but which he certainly must adapt to his own work. Proper histories are likewise an important problem and one cannot accept at full face value the statements of patients as to their etiological relationship—a very great deal more must be known than mere assumptions by the patient.

Of health supervision procedures, there are periodic health examinations, the supervision of corrections of physical defects, and the practice of first aid to minor illness in the industrial dispensary. The correction of physical defects and follow up on sickness cases is the special field of the private practitioner. The industrial physician here acts merely as a supervisor or health officer and sees to it that the necessity for further observation and treatment be placed in the hands of the private practitioner.

Special examples of the lack of the proper application of special knowledge, in personal experience with industrial practice, are as follows: lack of properly trained men to guide medical and health programs in industry; difficulties in getting surgeons to do periodic re-examinations as a part of industrial health programs; mistaken diagnoses with reference to occupational disease cases found in hospital and clinic records in well recognized institutions; the signing of death certificates without adequate knowledge of primary and contributory causes of death; peculiar and bizarre findings in reports of specialists, including internists, pathologists, toxicologists, and roentgenologists, in industrial cases; the appointment of special medical commissions by state departments, when such appointees have no special knowledge nor experience in industrial medicine, but have been chosen rather for reputations in general medicine.

The problems of postgraduate and undergraduate medical education are those which should be specifically studied by the Council on Industrial Health and the Council on Medical Education. There should be, however, a great deal of non-medical material included in such courses, as well as the medical fundamentals.

Finally, it is evident that those in general and special practice of medicine, outside of industrial work, must depend on sources of technical information for adaptation to industrial work. This includes more than knowledge about the patient himself—it presupposes some acquaintanceship with the principles of management, and with materials, methods and machines in industry.

DR. J. L. BLAISDELL discussed "Disability Evaluation in Silicosis."

Before beginning this study the respiratory tests of McCann were investigated very thoroughly and studied particularly with adaptation to the work of this report. It was felt that such tests could evaluate fairly accurately disability in silicosis, as they have been adapted to individuals in this investigation.

The tests which were finally accepted as being adequate were composed of two parts—the first part, the estimation of the total pulmonary capacity (including the residual air, reserve air, tidal and complemental air) and secondly, a study of the pulmonary ventilation of the individual before, during and following exercise, by the use of a bicycle erdometer.

As a part of the work also, six-foot plates of the chest were taken at maximum inspiration and maximum expiration; the total area of the lung fields was measured on the films and the anterior-posterior diameter of the chest was also measured. This permitted the computation of what is known as the radiological volume of the chest which is equal to the anterior-posterior diameter times the area.

The erdometer readings were taken on a group of average miners of 20-30 years of age at a level of 300 kilogram-meters per minute and also at a level of 600 kilogram-meters per minute.

It was found that one could predict the values of actual pulmonary ventilation by the use of the formula of the radiological volume of the chest, the one which has been previously mentioned. In such instances, the predicted pulmonary ventilation agreed fairly closely with the observed pulmonary ventilation.

A number of subjects were described with respect to their measurements and reactions to the exercise tests, by the use of lantern slides giving the data both as to observed and predicted pulmonary ventilation.

Four cases were described in this series. In the first case, it was found that in spite of anatomical findings on the radiogram of advanced silicosis, there was on interference with good pulmonary function and capacity—that the subject was using only 31% of his capacity when working at 600 kilogram-meters per minute. In another case which also had considerable involvement, but not as extensive as the first, it was found that the subject used 51.8% of his maximum pulmonary capacity in working at 300 kilogram-meters per minute. In the third case it was discovered that there was no disability in spite of an alteration of the pulmonary ratios—that the subject used only 29.6% of his maximum capacity when working at 600 kilogram-meters per minute. In the fourth case, the residual air amounted to four times what it should be; the subject used 61.2% of his maximum capacity at 300 kilogram-meters per minute and 100% of his capacity at 600 kilogram-meters per minute.

It has been established that the ratios are not sufficient data for the measurement of disability—one must have the exercise reaction in addition.

These methods probably constitute the best that we have for the determination of disability of silicotic subjects.

In the discussion of DR. BLAISDELL'S presentation, DRS. LEROY GARDNER, M. L. KALTREIDER, L. TELEKY, H. H. KESSLER and PROF. DRINKER made various remarks. It was especially emphasized that DR. BLAISDELL has a very fine research laboratory and good human material available among the miners at active work. The important thing to remember is that is function is not proportional to anatomic change.

It is well to remember that these procedures have been applied in a research study and have not yet become adapted to general problems.

Monday Afternoon Session—Hand Injuries

AT THE Monday afternoon session on "Hand Injuries," DR. JAMES M. WINFIELD spoke on "Anatomic Diagnosis of Injuries of the Hands."

The hand, as Kanavel said, being the individual's most valuable asset, the surgeon must exert the utmost diligence in diagnosis, treatment and care. Though the number of hazards in industry is being reduced, there still are injuries. It is imperative that exact diagnosis be made as to cause, extent and nature of the lesion; neglect or carelessness here may mean a degree of uselessness. In the words of Koch, no one lesion overshadows a lesion of the hand and associated lesions. Proper treatment requires a thorough knowledge of the anatomy of the hand; this is complex, and difficult to understand, but the function of the hand is of paramount importance. Hand injuries involve injuries of (1) tendons, (2) nerves, (3) bones, and (4) blood vessels. The first step is to ascertain exactly how an injury was incurred. Crushing injuries on bony structure require special analysis; and injuries of any kind that are contaminated require special treatment. Injuries of tendons, wrists, and fingers with reference to the function of grasp, were described; and slides were shown illustrating (1) tests for sensory disturbances involving median and ulnar nerves; and (2) signs and symptoms characteristic of certain injuries, such as the dropping of the knuckles with fractures of the metacarpals. It is always advisable to employ x-rays, in two views. In addition to diagnosis, exact knowledge is necessary for repair; the identification of nerves, tendons, and blood vessels demands experience and knowledge of a high order.

DR. HARVEY S. ALLEN, speaking on "Treatment of Superficial Hand Injuries and Burns," dealt with (1) sharply lacerated injuries, and (2) crushing injuries. As to the first, the purpose of treatment of these is to convert open wounds into closed wounds. This may safely be done within eight hours; after that such wounds with certain exceptions — such as the human bite — become infected instead of contaminated. It is essential to control bleeding, by pressure over sterile dressing, including splints when necessary, for removal to the hospital. The operating room personnel should be trained in emergency procedures, and the equipment should be adequate. Masks should be worn, to avoid coughing, or even talking, into a wound. When the patient is comfortable and out of shock, the wound may be cleansed; scrubbed with white soap, using cotton pledgets, and sterile mechanical means, with minimum irritation. Then the cleansed wound is covered and the surrounding skin scrubbed sterile, water and soap being applied after change of rubber gloves. This is followed by continuous irrigation with sterile saline solution. Anesthesia may be required, but often with gentle handling it is not necessary. After another change of gown and gloves the repair may be undertaken. With the blood pressure cuff at 260 mm. of mercury, on the upper arm, determine the exact extent of the wound, deep or superficial, and then the method of closing. No wound should be closed under tension. Having closed, apply large fluffy dressing, and splint, and do not disturb for from five to eight days. All patients should be given tetanus antitoxin. As to crushing wounds, there is the added importance of crushed tissues; and the study of the injury itself as well as the blood supply; deep hemorrhage is often overlooked. These wounds should have the same emergency care as simple lacerations. Burns are treated the same as injuries. In general, the important considerations are the emergency care—simple surgical dressings, pressure to keep the tissue firm and flat, particularly where, as in finger-tip injuries, skin grafting may follow, and the anticipation and control of shock; together with the immediate means to control contamination and prevent infection, particularly from human sources. The rest is non-interference with dressing when there is no good reason for not letting them alone.

DR. MICHAEL M. MASON'S subject was "Division of the Nerves and Tendons of the Hand." Repair of hand injuries with assurance of success is the modern method. The prerequisites are (1) realization that healing depends on healthy tissues; and (2) the patience to work slowly and carefully. Involved in these are: such careful handling as adds no injury by surgery; proper first aid; sterile dressings, with pressure; avoidance of contamination; handling which imposes the absolute minimum of additional trauma; the excision of devitalized tissues; proper antisepsis; no large instruments; control of bleeding during operation; irrigation at that time with normal saline solution; and suture material least irritating as to size and chemical composition. No tissues are as susceptible to infections as tendons; strict antisepsis must be the rule. The talk was elaborately illustrated with slides showing methods of handling nerve and tendon injuries; sutures of nerves; refinements of technique in nerve-end sutures; primary repair; accessory incisions — these involving less added trauma than probing; methods of enlarging; secondary repair; and indications of time periods for rest, and the beginning of use by motion.

DR. HENRY C. MARBLE spoke on "Importance of Purposeful Splinting Following Injuries of the Hand." Purposeful splinting involves not so much the splint as the man behind it. In the old methods of splinting, the hand was extended; in the new, the hand is at rest — in a position of ease. It is necessary to think of the position in which the hand is in "neutral," the muscles in equal tension. Thus the order is: put the injuries at rest; transport them to where they will receive definite treatment; treat them; and then splint them in the position of rest. Injuries, burns, "wringer-hands," to be transported should be put in position to transport; cotton permits pressure, use it plentifully, and splint in the position of rest. For injuries about the wrist, splint in the position of weakness — until they can be splinted in that of strength, as where the grasp is involved. Metacarpal fractures are best splinted in extension; phalanges in flexion. In tendon and nerve injuries it is necessary to know the anatomy; thus, the median nerve supplies all the muscles of the thumb — if the thumb is injured, then put those muscles at rest. The whole purpose of splinting is to put the nerve and the muscles it serves at rest, in a

position of weakness, until there is sufficient healing to sustain a position of strength. There are many splint materials — wood, aluminum, leather, steel, plaster, even plastics — all can be made into splints that will do whatever splints are required to do, provided the man behind them knows what he wants them to do. Following proper splinting, and of course proper diagnosis and repair, the best results are obtained with a minimum of physical therapy and a maximum of active use intelligently directed. Adequate occupation under such circumstances is better even than massage; so far no activation of infection has been encountered from work properly designed and limited. There is a lesson to be applied from the methods of the orthodontists. They have no calendar; their slow and tender persuasion, gently prolonged, has its counterpart in recovery from various contractures. Purposeful splinting anticipates the purpose for which the splint is to be applied and the results to be obtained; given these, the splint can be fashioned to do the work necessary to be done.

DR. SUMNER L. KOCH spoke on "Prevention and Treatment of Hand Infections." The infected wound should be operated with utmost care. The wound, opened, should be drained with a soft, non-traumatizing substance; there is no more certain way of adding infection than by drains added day by day. After proper dressing and splinting, external heat is applied for three or four days — congestion is to be avoided. No less important is clean surgical care during the postoperative period. Further infection at this time can do incalulable harm. Such can be introduced in the dressing. There must be perfect daily care during the entire period of healing. Some of the worst infections are the result of an incision for drainage, following by dressing and instructions to the patient to go home and soak every few hours in sterile solution. With surgical cleanliness in all postoperative care there need be no further infection.

Monday Afternon Session—Personnel

MR. WARREN A. COOK spoke on the subject "The Industrial Hygiene Engineer."

Comparisons were first made between what happens when there is an intelligent industrial hygiene engineer available and the conditions which arise when such a man is not available. Two such examples were cited, one with reference to a high labor turnover experienced in the manufacture of artificial leather some 15 years ago, when expert industrial hygiene engineering advice was not as easy to get as it is at the present time. An unusual number of compensation claims followed before the employer finally adopted the right means of controlling the hazard.

The other example was the disproportionate emphasis placed on silicosis with the resulting difficulties which occurred.

With respect to present resoures in trained industrial hygiene engineers, it can be stated that only the large industrial concerns have full-time industrial hygienists and chemists with laboratory and field equipment. In the development of industrial hygiene services in state health and labor departments, there has been no instance in which the unit has been overmanned and in every case, it has been necessary to watch the program carefully to avoid taking up too much time with activities that might not be fundamentally as important as others broader in scope.

Present training facilities involve certainly not more than six representative universities in the country. The Division of Industrial Hygiene of the National Institute of Health has also presented brief courses during the last five years. The National Conference of Governmental Industrial Hygienists and the American Industrial Hygiene Association are further expressions of groups interested.

As far as needs for the immediate future are concerned, it was recently brought to our attention that because of the immediate need for 200 to 500 non-medical industrial hygienists, plans are now in progress for the development of short, concentrated courses on the practical application of industrial hygiene, through appropriate university courses throughout the country.

In conclusion, it can be stated with certainty that there is not a sufficient number of trained industrial hygiene engineers to cover adequately the present exposures to occupational disease hazards. Although present training facilities are recognized as inadequate to take care of the increased need in the present emergency, plans are now in process for setting up short time training courses. However, the demand for the full-time industrial hygienist should be stimulated only as the actual need arises. Finally, every effort should be made to assure that capable men are given practical instruction and that the expansion program should fit as exactly as possible the actual needs of the national defense program.

MR. R. L. FORNEY of the National Safety Council (in the absence of MR. W. H. CAMERON, the Managing Director) presented the subject "The Safety Engineer."

Three questions were asked at the outset by MR. FORNEY: (1) Are there shortages of personnel? (2) What are the present facilities for training? (3) What can be done to improve the present training facilities, if they could be improved?

The comment was made that there really is no shortage, but more trained men in safety work will be needed for the defense emergency. In the experience of the National Safety Council, however, it has been found that there has been in the past three months a considerably increased demand for trained safety engineers, which does indicate a shortage.

As yet no college has designed a course leading to a degree except the University of Alabama. This came about within the past year.

Heretofore, the training has been mostly informal, although there has been formal training. Group meetings, class and other types of discussions have been instrumental in building up a body of information which is practical to the safety engineer.

The biggest problem has been found to be with respect to public safety and so-called "off the job" accidents. There has been, as it happens, more practical training in non-industrial safety than in the industrial type.

With respect to an answer to the third question given previously, there is bound to be more formal training instituted, and such training will and must become more specific as time gives the indications of what that specificity should be.

DR. PAUL A. NEAL discussed "The Medical Industrial Hygienist."

Three questions asked at the outset of this discussion were: (1) To what objectives does the true medical industrial hygienist subscribe? (2) What qualifications are necessary? (3) What are the current needs with respect to the supply of medical industrial hygienists?

The objectives of the medical industrial hygienist are essentially protection of the health and safety of employed population. There is also of course the restoration to employment of those who are disabled and the reduction of morbidity and mortality in industry.

The duties of a medical industrial hygienist have been duly discussed in the proceedings of the Conference of Governmental Industrial Hygienists.

The required personal qualifications of the medical industrial hygienist have also been set down in Public Health Bulletin No. 259 on "A Preliminary Survey of the Industrial Hygiene Problem in the United States," a publication of the U. S. Public Health Service.

As to the current needs, these will vary as to different types of groups which are to be served. It is not possible to set down a definite number with respect to the number of medical industrial hygienists which will actually be needed. We do know, however, that there will not be a sufficient number to handle the increase necessary to mobilization.

It is possible to state that 10 additional men have been provided for at the present time on the staff of the U. S. Public Health Service. It is also definitely known that the number of medical industrial hygienists available is not

sufficient to supply the state demand at the present time.

Training, an important phase of the subject, is not given as much attention as it should be, primarily because of the lack of demand by physicians, and also because of the lack of funds which are provided.

The whole problem of the availability of the medical industrial hygienist now constitutes a definite challenge to the medical profession.

DR. ROBERT T. LEGGE discussed the subject "The Physician in Industry."

It is believed that there are indications that political supervision will occur in industrial medicine unless organized medicine leads the way.

When industrial cases arise, the industrial physician should be invited to participate in consultations with private practitioners.

The employer should now realize that the physician who is untrained is just as useless as an untrained mechanic.

Comments regarding qualifications of industrial physicians were made with reference to previously accepted standards by official industrial medical groups.

It may be obvious to state, but it should be repeated that there are real shoratges of personnel among industrial physicians—that is to say, trained men.

Industrial medicine is both essential and profitable to the employer and the employee.

There is certainly very increased demand for the application of medical ethics to industrial situations. The Council on Industrial Health is now preparing a code of ethics and a syllabus of terms.

The development of industrial physicians and industrial medicine has kept pace with progress in this field. The important thing is regulating the supply to meet the demands of industrial hygiene activities, nursing in small plans, and adequate education of employers as to what medicine is doing for industry.

In the discussion, MISS JOANNA M. JOHNSON, PROF. THEODORE HATCH, MR. AMBROSE KELLY, and DRS. LEONARD GREENBURG, and ALBERT S. GRAY brought out important points.

To stimulate the interest of the smaller employer, PROF. LEGGE believed that organized service should be provided for small plants.

PROF. HATCH stated that the courses were already overloaded in most of the schools. An interesting comparison was afforded by making a simple breakdown of the membership list of the American Industrial Hygiene Association of 259 persons, of which 58 were physicians, 137 were engineers and industrial hygienists, 30 were chemists, eight were nurses, and 30 were of a miscellaneous type of occupation. It is important to incorporate changes in the protective equipment at the beginning of installation.

MR. KELLY was reminded of the shipbuilding program in World War I and hoped that we would use all possible aids to avoid the mistakes of our industrial expansion at that time.

DR. GREENBURG spoke of reminiscences of 1918 in the Public Health Service and emphasized the need for new personnel as quite fundamental at the present time.

DR. GRAY compared the situation to the use of a lot of airplanes to do work for a rather short period of time, as they do not last. He thought that training a lot of people in short intensive courses might solve the problems. These, however, must be carefully chosen and this is really the job to be done. First, it is necessary that we make a start.

DR. BARTLE concluded the discussion by stating that he had been 37 years in industrial medicine and had been much impressed with the romance and adventures in the specialty. He congratulated DR. LEGGE and agreed with DR. NEAL and MR. KELLY. He stated that he merely wanted the chance to take on young men and train them in a large industry, in order to produce good personnel. However, one must keep abreast of the times and he had a recent experience in finding that young men did not know, for instance, the dangerous effects of sulpha compounds. He asked if this was really culture, and what after all would be the significance of psychological tests in these people. He believed, in conclusion, that industrial medicine was on a very sound basis.

Tuesday Morning Session

DR. D. L. LYNCH'S paper on "Employability of the Physically Handicapped," presented, in the main, the figures and analyses of the Report of the Committee on the Employability of the Handicapped, of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS which was published in INDUSTRIAL MEDICINE for September, 1940, pp. 441-450, concluding with the findings that the handicapped in employment are careful, industrious, and less given, than their more fortunate fellows, to resignations, absences, and discharges for cause. Those who are close to the problem presented by the handicapped may well take courage in the fact that proper placement can bring this problem into adequate control. The heretofore prevalent feeling that the physically handicapped are more likely to cause accidents than other employees is not sustained by any statistics; the handicap, contrary to previous opinion, does not introduce a hazard. Likewise, the fear of second, or subsequent injury has no basis on the record. It should not be a barrier to re-employment. The fact, sustained by all available figures, is that the percentage succumbing to disability among the handicapped who are employed is less than among the non-handicapped, while, within the limitations of work they can do, they are equally efficient.

DR. EDWARD J. STIEGLITZ spoke on "Aging as a Problem of Industrial Health." In this subject most arguments arise from conflicting definitions of terms. Being aged is the consequence of aging. There is a distinction; geriatrics treats of the diseases of old age; gerontology of the process of aging. Interesting to industrial physicians are the two decades 40-60; prophylactic geriatrics are important here. The problem in general is the biography of senescence; and the clinical problems are the diseases of advancing years — the structural changes, the psychological changes, the changes not sharply defined, the phenomena of diseases. Certain socio-economic factors are also involved, such as the increasing average age of the population. The fact, insistent above all study of causes, is that the aged must in general support themselves or be supported. The former they can do only by work adapted to their capacities. These elements of the problem are presenting, and will present more and more in the future, situations which are unprecedented. But the practice of medicine is also changing, adapting itself to the increasing prevalence of the chronic and progressive diseases of mid-life. Industrial medicine is now acutely aware of its preventive necessities — illustrated in its developing attention to absenteeism; in general, the gospel of adult preventive medicine is well understood in industry. This includes more and more the hygiene of senescence. Among the opportunities for the industrial physician are placement, and psychology, with reference to the aging — concerning which much interest is now being manifested. Although the frequency of industrial injuries decreases with age, the health maintenance problems are more apparent. In industrial medical procedure examination is imperative. Here, arbitrary standards have no place; there is no definition of health; it is more than mere absence of diseases. And chronological age is not the same as physical age; this varies with the individual. Among the problems of aging is the mental senescence; men are as old as their range of mind, their imagination. But there is no single criterion of physical age. It is a continuous progress, most rapid in the infant, more accelerated in the aging than in the aged. Endurance grows in the older — witness the marathons — and the greater skills are not coincidence, as the captains, and directors can exemplify. And the greater the age, the greater the individuality. To meet the enhanced departures from standards in the older, the industrial physician must depart from standardized routines. The causes of disability of interest to industrial medical men include cardiovascular manifestations, arthritis, diabetes mellitus, cancer, and hypertension. The study of degenerative diseases is important in evaluating the degree of disability. Control rather than cure should be the rule. Industrial medicine can do much in measuring functional

capacity. Here it has the invaluable industrial privilege of re-examining, checking previous examinations — for something missed before, and the reason for it. Is the chronic absentee in the wrong job? Capacities use compensatory characteristics, but unequal competitions mean neuroses.

The subject as a whole presents a plea for better utilization of the older; they can be used — even trained; the older learn only more slowly. And they are willing; no one appreciates more than the older man that the patient has his share in preventive medicine.

Acute Respiratory Disease in Industry

DR. ANTHONY J. LANZA, speaking on "Incidence and Costs of Acute Respiratory Disease in Industry," said that geography shows little variation as to incidence, but women show a higher absentee percentage than men. Colds cause more lost time than any other condition. A reasonable estimate is that on the average every person has two colds per year. A part of the apparent increase in the number of colds causing disability may be due to the increasing tendency of employees with colds to stay away from work. The best information gives the time lost from colds as averaging one day per year per person, male and female. This means 25 million days a year, the full time loss of 150,000 persons, with a cost, to the employees in wages lost and medical expenses of 400 million dollars, and to the employers in reduced production, plant disarrangement, etc., of at least an equal amount, (although the usual estimate is several times more), involving a burden of waste man years from cold of nearly a billion dollars. This is its own argument for scientific study and attack.

DR. CAREY P. McCORD, on the subject of "Respiratory Disease and Air Conditioning," said that whereas, in both work conditions and schools, diseases of the respiratory tract predominate, it was supposed that air conditioning would get rid of causes in this respect and produce a reduction in incidence. But first, a charification of terms. There is *ventilation*, controlling heat, cold, drying, washing, purifying — removal of gases, dusts, and vapors. And there is *air conditioning*, the objectives of which include the comfort and health of the occupant affected by it. The latter has various manifestations, air conditioning: complete, partial, for human beings, for materials, and for therapeutic purposes. Among studies related to respiratory diseases, filtration was found to be of value, and likewise the ultra-violet light; but there is no proof as to a decrease in the incidence of diseases produced by bacteria that the ultra-violet would kill. Comparative studies, in Detroit, in two buildings side by side, of equal size and with 875 workers each — two-thirds women, — one building air conditioned, the other not, showed that as to frequency and severity of respiratory troubles, in 730 days, there was, astonishingly, no difference between the groups in the two buildings, on a day-by-day, or period-by-period basis. From the aggregate of available information of this kind, it may be concluded that there is at present no good evidence supporting any broad belief that air conditioning leads to any reduction in colds or respiratory diseases in general. It seems reasonable that it should, but it does not. Reduction in morbidity need not be expected. There is, of course, the possibility of continuous optimal air conditioning. But no experience of that kind has been had. Some results are claimed in hospital installations, but the people affected in hospitals are not in normal condition. In one study, which assumes importance, the attempt was made to infect a group under optimal air conditioning. It seemed impossible to infect them. In summary, it now appears that the control of ordinary diseases of the respiratory tract depends to a greater extent on human conditioning than on air conditioning.

DR. GEORGE M. PIERSOL, discussed "The Role of the Physician in Industry in the Control of Acute Respiratory Disease." The prevention and control of these conditions is today the most important challenge to physicians in general and to industrial physicians in particular. Losses from these causes, reckoned in time and money, are stupendous; there is no more urgent problem facing industrial physicians than that of ways and means to control them. As to some of these the specific etiologic phases are not clear. There seems to be no satisfactory immunization against respiratory infections. And there is a certain lack of understanding or lack of interest in such a common condition as the ordinary cold. Yet it is more serious from the economics of its prevention than major accidents. The effects of industrial medicine begin with the pre-employment examination; enlarged and infected tonsils, sinus conditions, chest conditions, cardiovascular conditions are all to be taken into account. And industrial medicine can make plain to the family physician the importance of follow-through in correction and cure. Initial steps in prevention involve a check-up of absenteeism while it exists rather than after it is over; an early report system whereby the medical department is advised concurrently, so that it can investigate the causes of undue frequency, and control contributory causes. Infections are so easily conveyed — contacts, towels, cups, sneezes; there should be supervision of the slightly ill, and removal of the seriously ill from contacts with his fellows. Prevention in the work place means education in all the standards and refinements of prophylaxis. Attention to these will head off epidemic conditions. Employees are amenable to instruction and suggestion. Immunization is still experimental; the common cold is still the outstanding problem in industrial medicine.

In the general discussion which closed the morning session, DR. WILLIAM A. SAWYER, referring to the paper by DR. STIEGLITZ, spoke of measures for evaluating the physical ages of usefulness, and of tests for functional capacity in this relation. Individuality is the composite of the inherited, inherent, and cumulative vicissitudes of existence; and health supervision is effective only if what is found initially is checked subsequently, with constant coordination between the function and the job — the individual's accumulated experience being taken into account in replacement, reassignment and retraining.

Tuesday Afternoon—Industrial Ophthalmology

DR. HARVEY BARTLE, presiding at the session on "Industrial Ophthalmology," spoke briefly on the importance of the care of eyes in industry, recommending that it become established practice that examinations include the relation of the eyes to diseases of general character, with stress upon all means whereby the follow-up in employment will enhance the care of sight. Industrial medicine can be of great use in this connection.

DR. LEONARD GREENBURG discussed the "'Economic Importance of Visual Disability in Industry." The realization of the problems involved here is late, but the problems are present in full force. These have two phases: (1) the eye disabilities brought to industry by, and associated directly with, the individual; and (2) those associated with industry. The former are only now beginning to receive attention; they involve largely lack of corrective glasses, color sense deficiencies, and muscle imbalance.

DR. HEDWIG KUHN's analysis shows about 12% refractive, 16% stereopsis, and 22% muscle imbalance. About 12% of all workers have serious visual defects. As to the latter, the disabilities associated with industry, they result from (1) trauma, and (2) special types of visual application—clerks, hosiery workers, etc. Trauma involves flying substances, liquids, fluids, etc. Statistics in this relation have been incomplete. The consideration of the economic eye injury includes any injury which causes economic loss. The ideal basis for study here would be all injuries that cause as much as one-day loss of working time; but Ohio is the only state requiring *all* accidents to be reported.

In summary, the total loss in respect of eye injuries, from the various figures now available in various states and localities, adds up to more than 26,000 man years in the United States. This also constitutes a challenge to industrial medicine.

DR. SIDNEY WALKER, JR., discussing "Essentials of First Aid and Later Management of Industrial Eye Injuries," emphasized the fact that the parties interested in the injured eye include not only the patient, but also the employer and the insurance carrier, and that the interests of all of these are in no way antagonistic—the idea being to return the injured man to his work in the shortest possible time. Industrial eye injury prevention requires adequate shielding of machinery and insistence upon the wearing of shock-proof goggles. It is interesting to note that men over 45 are the most consistent users of the various means provided for eye protection. The initial examination of an injured eye should include not only the condition of the eye, but also should involve a rapid survey of teeth and tonsils at the same time. The first consideration is to make the patient comfortable, with local anesthesia, then examine for foreign bodies—small ones are often overlooked, the iris pigment sometimes masking their presence. If the wound is deep, use atropine—put the eye at rest. Look for evidences of glaucoma—the sooner this tendency is found the better. Do not use patch or bandage under any circumstances; coverings dam up secretions, and infections develop. Have the patient use warm applications night and morning. In particular, never bandage burned eyes—the traumatic effect of chemicals is likely to be prolonged. Deep lacerating penetrating wounds should be sent to the oculist immediately—there is too much risk to the plant physician in the possibility of an end result that could have been avoided in specialist hands. Some diseases simulate injuries; claims are exaggerated. It is best in all cases where there is any question to refer to the oculist; and the earlier the better where there is likelihood of a legal follow up. In most cases the oculist is best qualified as to the fact of compensability or non-compensability. In summary: (1) test the visual acuity of the injured eye; (2) be sure that the injury which is apparently trivial does not contain the presence or potentiality of infection; (3) make the patient comfortable; (4) remember that bands and poultices tend to dam up secretions which should be removed; and (5) consult the oculist as soon as possible.

DR. ARTHUR M. CULLER, spoke on "Detection and Control of Defective Vision in Industry." The prevalence of defective vision in industry does not mean weed out the defectives but correct the defects. About 55% have normal vision; about 25% defects that are uncorrectible; and about 20% defects that can be corrected. In studying the 25%, it is necessary that great care be exercised; the importance of examination for pre-existing defects cannot be too strongly emphasized. In these examinations no previous record should be assumed; the facts as found on competent study should be the guide to placement in work. Tests, therefore, should be conducted with utmost care. An examiner, on the one hand, may let a man get by who has memorized the card; on the other hand he may lose a very efficient worker by arbitrary turn-down. The follow-up should include a full report on file, and a check-up as to glasses or remedial measures found necessary. Many with defects can be made useful; but no one with but one eye should be in any job where there is exposure to flying particles. It has not been feasible to classify occupations on any basis of visual requirements. A schedule of occupations, on the basis of individual plant requirements, however, should enable the industrial physician to do a very effective job in his own situation. Foreign bodies are still the great hazard, although infections are a close second. It is important to understand what injuries affect the vision; the visually defective have more than their share of accidents.

In discussing this presentation, DR. HEDWIG KUHN spoke of the efforts now under way, particularly at Purdue, to develop a basis for evaluation of the factors involved in this problem. The cumulative effect of careful examinations and full records of the same will ultimately enable such a basis to be established. Meanwhile it is important (1) that full visual tests be made of all employees; and (2) that the initial examination be made very complete. The yardstick of efficiency must involve what the eyes are required to do at work; and the studies in progress along this line are calculated to enable the requirements to be studied in this relation, as well as from the standpoint of the condition of the eye itself as expressed in terms of standards heretofore prevailing.

DR. THOMAS D. ALLEN'S paper on "Protective Equipment for Eyes in Industry," discussed the various ways and means available for eye protection, stressing the necessity of their maximum use in view of the large number of eye accidents—10% of the total of all accidents, not including the subsequent difficulties of those whom the accidents leave with but one eye. The problem of protection begins with management; the employee does not make the conditions of work, and the physician's cooperation is highly important in making these as hazard-free as possible. The value of this kind of cooperation is shown in the experience of one smaller concern which spent $25,000 in two years on installations of protective measures which saved $116,000. Examinations, at least every two years, are important protective measures, as are examinations following any illness. Good health and good vision eliminate mistakes and poor workmanship, and are the initial basis of protection—upon which should be superimposed all known measures to eliminate and control the hazards, of which, briefly, 80% are from flying bodies; 8% from tools or parts; 7% from splashing of liquids; 2.5% from explosions; 2% from falls and 0.5% from infections. These figures and the protective measures for each of the hazards involved, were fully illustrated in a series of slides.

Wednesday Morning Session

A CLINIC and symposium on Industrial Dermatoses, with DR. FRANCIS E. SENEAR presiding, was held at the University of Illinois College of Medicine, at 10 A.M. on Wednesday morning, as a part of the program arranged through the Joint Committee on Industrial Dermatoses of the Section of Dermatology and Syphilology of the American Medical Association, and of the American Dermatological Association.

DR. LEONARD F. WEBER and DR. MAURICE DORNE presented the clinical cases and conducted the symposium.

Case 1 was that of a girl restaurant employee who showed paronychia and onychia of the hands. Cases of this sort occur particularly in occupations where the hands are wet and where there are exposures to fruits and vegetables; in this instance there was considerable contact with lemon juice. In a differential, one must distinguish these affections from monilia and the toenails should also be examined for mycotic infection. The treatment is mainly to remove from the occupation or to change the occupation. The wearing of rubber gloves is found quite difficult, since they tear easily. In connection with the discussion of this case, a list was mentioned of occupations where these difficulties arise. In considering the history of the case, this should include special occupational data, including the duration of the complaint and the type of hobbies that the individual may have.

Case 2 was that of a young man, a tannery employee who had had no previous skin trouble. He had had an eruption on the hands and wrists for a period of one month. Occupational history showed that he had been exposed to chrome work in the tannery. At first there was redness and oozing of the backs of the hands and the flexor surfaces of the wrists. After treatment for 12 days, he was much improved. In the discussion of this case, it was emphasized that the exposed parts are those which are usually affected in occupational dermatoses. Many occupational cases are characterized by a follicular erythema which changes to a diffuse eruption later.

In the discussion of these cases, there are certain medical criteria of the first order: (1) inception of the eruption after a reasonable period of exposure; (2) a dermatitis disappears or improves after cessation of work; and (3) recurrences and exacerbations occur upon further exposure in the previous occupation. Medical criteria of the second order were mentioned, as (1) the areas of maximum exposure involved; and (2) the character and location of the eruptions is specific. It is also important to

know whether other workers have shown similar reaction. Pre-employment patch tests probably are not important, but an examination of the skin in reference to the occupation is rather significant. Protection may be rather difficult in some types of jobs. Especially is it important to have attention to personal cleanliness.

At this point in the presentation, DR. DAVID C. STRAUS commented on recent favorable experiences with the use of sodium hyposulphite solution among workers exposed to chrome processes.

Case 3 was a man of 55, occupation — painter for 30 years. No previous cutaneous disease. Doing inside work one month ago he used a powdered soap in washing walls. He has now been away from work for a period of 13 days, but still has some eruption on the flexor surfaces of the forearms. Sensitivity to turpentine should be eliminated in considering this case. There is a question of using patch tests for this purpose. It is difficult to adapt patch tests to the use of soap, as previous experience has shown; the results are not satisfactory, because of so many positive reactions.

Case 4 was a man 30 years of age, occupation soda fountain clerk and cook for 12 years. Second attack of dermatitis came last December. He was treated while working. There has been no improvement. Three weeks after removal from his job, the eruption cleared. He was allowed to go back and had the same eruption. He has now been off for five days and has improved considerably, although there is still redness, scaling and fissuring of the fingers. The other portions of the skin are normal, except that there is some maceration between the toes and one toenail is thickened. However, it is not believed that the lesions are ringworm of the fingers; this is probably a friction dermatitis.

In further discussion of the medicolegal aspects of dermatitis cases, Section 172.6 of the Illinois Occupational Diseases Act was read and discussed. This section has to do with the definition of an occupational disease and has been quoted many times.

Case 5 occurred in a cement worker employed over many years in this occupation. Previous attack of dermatitis 18 months ago. The present attack took place last December. There has been no occupational exposure since December 26, the man now having the job of a watchman. Lesions are found over the scalp, back of the ears, over the back, in the axillae, over the pubic region and is probably a seborrheic dermatitis. Such lesions are worse in the summer and are also worse when working in so-called quick setting cement. The patient had been under observation for two weeks, but was not much improved. The fact that there are a greater number of lesions of the extensor surfaces is against an occupational dermatitis.

Case 6 was another case of cement dermatitis, the patient being observed in the Research Hospital. Later, however, it was believed that this was not due to cement. The eruption showed vesicles and bullae on the palm and the soles of the feet. The face and neck were clear.

Case 7 was that of a girl who had an eruption on the hands and forearms of many years' standing. There had been no occupational exposure whatever.

Case 8 was a man who had been under observation for four years, age 54, occupation a marble repairer. There has been an eruption of some eight years' standing on the hands and arms and some rosacea of the face. No improvement has been experienced resulting from removal from work. The lesions probably represent chronic lichenification. There is no suggestion of ringworm here. The flareups were concerned with the exacerbations of the rosacea. Coal tar was used as the basis for treatment which brought improvement.

Case 9 was a boy showing an eruption which was confined to the covered parts of the body and was not considered occupational. It was found later that the eruption was due to irritation caused by dyed pajamas. Redness and edema of the penis and scrotum were observed in this case. Along with the presentation of this patient was a general discussion of the effects of various types of clothing.

Case 10 showed multiple affected areas around the left knee and left shin. Methyl violet had been used along with bland applications. It was felt that this was an occupational dermatosis because several workers in the same group had shown similar infections.

In closing, DEAN DAVIS of the Medical School spoke briefly concerning the importance of industrial medicine and also with respect to the present curricular difficulties.

Wednesday Afternoon Session

THIS was a Symposium on Occupational Diseases.

MR. K. M. MORSE gave a paper on "The Industrial Hygiene Survey." Industrial hygiene and adult hygiene are synonymous. Since respiratory diseases are the highest in frequency, the majority of activities might well be concentrated on this phase. Thus industrial hygiene becomes a public health problem.

Industrial hygiene is to industry what child hygiene is to schools.

The basic information in the industrial hygiene surveys consists of (1) sanitary survey; (2) occupational analysis and (3) quantitative studies.

The sanitary environment is really the booster of morale. The occupational analysis is the backbone of the survey and should include a job analysis relative to exposures. The quantitative study completes the entire survey and is essential to adequate knowledge concerning industrial hygiene relationships.

Forms were shown on lantern slides concerning the registration of various types of industrial data adapted particularly to industrial hygiene studies.

The quantitive study not only being vital to the completion of the industrial hygiene information, also serves as a real guide for job placement and shows the basis for health programs, in addition to helping to evaluate physical examination data.

MR. DONALD CUMMINGS spoke on "Principles of Control over Industrial Health Exposures."

It is reasonable to suppose that we shall follow some of the leads of the British in their industrial experience.

In the beginning, it should be pointed out that there is a lack of appreciation of health hazards by industrial supervisory officers.

We should appraise the present methods in two ways: (1) control of the environment; and (2) control of the workmen.

There are only a few instances of real substitution, where substances can be substituted for others, really improving the hazard situation. Segregation of operations, exhaust ventilation and maintenance procedures are complex in nature.

In any situation where the permissible limits have been exceeded, the men should be examined and then exposure controlled, if deleterious results are found.

It is apparent that it will be rather difficult to improve our present practices even under emergency measures. There is little chance for innovation on account of the tremendous pressure which will be applied. But if existing standards are complied with, there should be no injurious results. The small plants are really "on the spot," and the industrial physician should be prepared to offer the same services to the smaller groups as to the large ones.

DR. MILTON H. KRONENBERG presented the subject "Pitfalls in Occupational Disease Diagnosis."

In beginning his discussion, DR. KRONENBERG drew a parallel with a local chapter of the Marketing Association which held a state clinic relative to business programs which have gone "sour." There are clinic reports of failures and they plan to hold again another "mistake" clinic. This principle was to be applied later to the material in DR. KRONENBERG's presentation.

Industrial medicine is a definite diagnostic undertaking that has previously been very empirical in its application. There are frequently situations where there are similar symptoms in occupational and non-occupational diseases, and therefore, specific tests and precedures are necessary to a conclusion. Some types are self-diagnosing. Etiology seems to be the chief difficulty. A careful

occupational disease history is very important. One must always keep the industrial aspects in mind, but cannot take the word of the patient without confirmation.

Following this preliminary discussion, a group of case histories were presented which showed the difficulties and mistakes in reaching a diagnostic conclusion.

Case 1—This involved a working group where three-fourths of the sickness cases involved the gastro-intestinal tract. Nothing was suspected until the workrooms were surveyed and a definite lead hazard found. Subsequent to this, many cases of intoxication were brought to light.

Case 2—This was an individual history of previous vague lower abdominal distress. After five weeks the man returned to work, but in two weeks after returning, had the distress. An appendectomy had been previously performed and a diagnosis of operative adhesions had been made. The next spring the case was again referred for consultation and this time a lead colic was discovered as being the real cause.

Case 3 — A case of acne was put on yeast and a rigid diet. Fellow workers were shown to have the same type of lesions. A survey resulted in showing that chlorinated naphthalenes was used in the processes and these were really the causes of the chloracne.

Case 4 — This was an individual showing hyperacidity, toxic goiter, and tremor of the hands. An industrial hygiene survey showed an abnormal mercury exposure. When control measures were put into effect, no more cases occurred.

Case 5 — This was an individual who had an eruption apparently from profuse sweating. In the processes there were dusts and shavings produced from wood. However, after details were obtained, it was found that the dust and shavings were coming from one of the new types of plastics. It seemed possible that this eruption might occur from profuse sweating in the summertime, but when such cases also occurred during the winter, the etiological relationship had to be revised.

Case 6 — This was a colored male with diagnosis of paralysis agitans without laboratory findings confirming the diagnosis. However, when the furnace operation activities showed manganese and the man was studied further, a diagnosis of chronic manganese poisoning was made.

Case 7 — This was an example of exposure to "hexa" used as a rubber accelerator. The rash was diagnosed by the family physician as scarlet fever and quarantine threatened. An industrial survey disclosed exposure to various rubber accelerators, among which "hexa" was found. This changed the diagnosis.

Case 8 — A female in a rubber factory showed a leucopenia and a sore throat. On hospitalization, a diagnosis was made of agranulocytic angina. Later on, an industrial survey showed a definite benzol exposure and the diagnosis later was changed to benzol poisoning.

Case 9 — A male aged 56 complained of frequent urination. Hypertrophy of the prostate was shown to be a contributory factor in the diagnosis. Later on, an industrial survey showed an exposure to ethylene dichloride and still later, engineering control of this hazard freed the worker in this instance of symptoms.

Case 10 — Two males in a shoe factory complained of vague symptoms and were found to have anemia. A later checkup showed that there was a benzol exposure and a diagnosis of benzol poisoning was made.

Case 11 — A male worker was treated for syphilis in a local clinic. He was told that his nasal septum was perforated and that he would have to be on treatment for some time. An industrial checkup showed that he was exposed to chromium compounds and that the perforation had occurred because of the effects of exposure to chromic acid vapors.

Case 12 — Four workers in a certain plant were troubled by vomiting and diarrhea and one became icteric. The nurse thought that this difficulty was due to food poisoning. A further checkup showed that all of these men worked in a carbon tetrachloride exposure which really caused the trouble.

Case 13 — Four laborers in a brass foundry were troubled with symptoms simulating an acute communicable disease. Two came down with what is known as metal fume fever, but were diagnosed as malaria by the family physician. Physician was consulted and quinine was discontinued after it was made plain what the difficulty really was.

The speaker did not try to illustrate cases of pneumoconiosis because of the shortness of the time and because also of the belief that a great deal of material had already been presented on this subject.

Because of the newness of industrial cases to medical science, it was believed that the justification of classification, special description and study was definitely proved.

MR. JAMES J. McKENNA presented the last number on the program "Occupational Disease Testimony."

In the beginning, MR. MCKENNA concentrated on what not to do rather than on what to do.

There have been great improvements in the adjudication of occupational disease cases; formerly there was a difference in jurisdiction — injuries were sent to the commission and diseases were referred to common law courts.

As a guide, MR. MCKENNA gave the following "don'ts":

1. Don't fence with opposing counsel.
2. You must be definite; know what you are going to say and be well informed about your subject.
3. Don't bluff.
4. Don't try to be an advocate.
5. Tell the truth.

These admonitions were interspersed with very lively illustrative experiences, told by MR. MCKENNA, and interesting only as heard first-hand from the speaker himself.

The Pittsburgh Meeting

—*Institute of Industrial Medicine and Industrial Hygiene*—

FOLLOWING is the tentative program of the annual meetings to be held in Pittsburgh, Pennsylvania, May 5, 6, 7, 8, and 9, 1941 — the Twenty-Sixth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, and the Second Annual Meeting of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION:

Monday, May 5

REGISTRATION—No Fee
9:00–10:00—WILLIAM PENN HOTEL
LECTURES AND DEMONSTRATIONS
MERCY HOSPITAL, Stevenson and Locust Street, Pittsburgh
JOHN P. GRIFFITH, M.D., *Chairman*
10:00–12:30—Mercy Hospital Staff
12:30– 1:30—Lunch
1:30– 4:30—Mercy Hospital Staff

Monday will be devoted to a series of Dry Clinics in Industrial Medicine and Surgery at Pittsburgh's Mercy Hospital.

Tuesday Morning, May 6

9:00—ADDRESS OF WELCOME
HON. CORNELIUS D. SCULLY, *Mayor, City of Pittsburgh*
9:15—ADDRESS OF WELCOME
FREDERICK JACOBS, M.D., *President, Allegheny County Medical Society*
9:25—ADDRESS OF WELCOME
JOHN T. SHAW, M.D., *Secretary of Health, Commonwealth of Pennsylvania*
9:35—RESPONSE
DANIEL L. LYNCH, M.D., *President of the American Association of Industrial Physicians and Surgeons*
9:40—RESPONSE
MR. WARREN A. COOK, *President of the American Industrial Hygiene Association*

ANNUAL MEETING—AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS

9:45–10:10 President's Address, DANIEL L. LYNCH, M.D.
10:10–10:30 "Some Practical Results of Periodic Physical Examinations"—A. J. KAMMER, M.D., *Medical Director, Inland Steel Company*, Indiana Harbor, Indiana
10:30–10:40 Discussion
10:40–11:00 "Relation of Trauma to Disease"—A. H. COLWELL, M.D., *Associate Professor of Medicine, School of Medicine, University of Pittsburgh*
11:00–11:10 Discussion
11:10–11:40 "Contact Dermatoses"—W. H. GUY, M.D., *Professor of Dermatology, School of Medicine, University of Pittsburgh*
11:40–12:00 Discussion
12:30– 2:00 Luncheon and Exhibits

Tuesday Afternoon, May 6

2:00– 2:20 "Sequelæ of Head Injuries"—S. S. ALLEN, M.D., Pittsburgh
2:20– 2:30 Discussion
2:30– 2:50 "Trauma Other Than Fractures"—J. H. WAGNER, M.D., *Carnegie-Illinois Steel Corporation*, Pittsburgh
2:50– 3:00 Discussion
3:00– 3:20 "Mental Hygiene in Industry"—C. H. HENNINGER, M.D., *Professor of Psychiatry, School of Medicine, University of Pittsburgh*
3:20– 3:30 Discussion
3:30– 3:50 "Evaluation of Circulatory Function in Extremities"—M. B. FERDERBER, M.D., *Department of Industrial Hygiene, School of Medicine, University of Pittsburgh*
3:50– 4:00 Discussion
4:00– 4:30 Business Session
4:30– 6:00 Exhibits

Tuesday Evening, May 6

INDIVIDUAL GROUP CONFERENCES

Wednesday Morning, May 7

9:00– 9:20 "Medical and Preventive Aspects of Carbon Monoxide Poisoning"—F. S. ROSSITER, M.D., *Carnegie-Illinois Steel Corporation*, Pittsburgh
9:20– 9:30 Discussion
9:30–10:00 "Recent Investigations of Effects of Radiation from an Ophthalmologic Viewpoint"—C. F. KUTSCHER, M.D., Pittsburgh
10:05–10:35 "The Absorption and Excretion of Ingested Lead Under Various Experimental Conditions"—R. A. KEHOE, M.D., *Kettering Laboratory of Applied Physiology, University of Cincinnati*, Cincinnati, Ohio
10:45–11:05 "Engineering Control of Lead Contaminated Environments"—G. C. HARROLD, Ph.D., *Industrial Hygiene Laboratories, Chrysler Corporation*, Detroit, Michigan
11:10–11:25 To be announced
11:30–11:45 "Lead Exposures in the Printing Industry"—R. T. HOMEWOOD, *Virginia Department of Health*, Richmond, Va.
11:50–12:05 "Incidence of Lead Poisoning in the City of Baltimore"—E. KAPLAND, Ph.D. and J. M. McDONALD, M.D., *Baltimore Health Department*, Baltimore, Md.
12:05–12:20 Discussion
12:20– 2:00 Luncheon and Exhibits

Wednesday Afternoon, May 7

2:00– 2.20 "Tuberculosis and Its Allied Conditions as Commonly Seen in Our Industrial Population"—C. H. MARCY, M.D., *Director Tuberculosis League Hospital*, Pittsburgh
2:20– 2:40 "Relationship between Tuberculosis and Inhalation of Various Substances from a Pathological Standpoint, Including Bituminous Coal Dust Inhalation"—S. R. HAYTHORN, M.D., *Director Singer Laboratory, Allegheny General Hospital*, Pittsburgh
2:40– 2:50 Discussion, R. R. SAYERS, M.D., *Director U. S. Bureau of Mines*, Washington, D. C.
2:55– 3:20 "Engineering Preventive Methods in the Control of Tuberculosis"—D. E. CUMMINGS, *Director Division of Industrial Hygiene, University of Colorado*, Denver, Colorado
3:20– 3:35 To be announced
3:40– 4:00 "Control of Tuberculosis and the Employment of a Tuberculous Individual in Industry"—W. A. SAWYER, M.D., *Medical Director, Eastman Kodak Company*, Rochester, N. Y.
4:00– 4:10 Discussion
4:10– 4:35 "Bacteria in Air and Disinfection"—A. E. WILLIAMSON and H. B. GOTAAS, *Department of Sanitary Engineering, School of Public Health, University of North Carolina*, Chapel Hill, N. C.
4:35– 4:50 "Variation in Bacterial Population in Certain Ventilating Systems"—A. HOLLAENDER, Ph.D., *National Institute of Health*, Bethesda, Md.
4:50– 5:00 Discussion
5:00– 6:00 Exhibits

Wednesday Evening, May 7

6:30—BANQUET

"The Role of Industrial Medicine and Industrial Hygiene in National Defense"—IRVIN ABELL, M.D., *Chairman of Health and Medicine Committee, Federal Security Agency*, Washington, D. C.

"Noise and Hearing"—V. O. KNUDSEN, Ph.D., *Dean of the Graduate School, University of California*, Berkeley, California

WESTINGHOUSE QUARTET

Thursday Morning, May 8

8:30– 8:50 "Design of Lateral Exhaust Hoods for Industrial Gases, Vapors and Fumes"—L. SILVERMAN, Sc.D., *Harvard School of Public Health*, Boston, Mass.
8:55– 9:15 "Ventilating for Electroplating Operations"—A. D. BRANDT, Ph.D., *National Institute of Health, Division of Industrial Hygiene and Sanitation*, Bethesda, Md.
9:15– 9:25 Discussion
9:25– 9:50 "Airborne Infection and Disinfection in Air Conditioning"—W. F. WELLS, *University of Pennsylvania*, Philadelphia, Pa.
9:55–10:20 "Local Cooling of Workers in Hot Atmospheres"—F. C. HOUGHTEN and M. B. FERDERBER, M.D., *American Society Heating and Ventilating sylvania*, Philadelphia
10:25–10:50 "Radiant Cooling"—C. P. YAGLOU, *Harvard School of Public Health*, Boston, Mass.
10:50–11:05 Discussion
11:05–11:20 "Comparison of Quick Methods for Quantitation of Impinger Samples of Granite Dust"—C. L. POOLE, *Rhode Island State Department of Health*, Providence, R. I.
11:25–11:40 "An Immersion Method for the Rapid Approximation of Quartz in Granite"—W. B. WARDLOW, *Texas State Board of Health*, Austin, Tex.
11:45–12:00 "Use of X-ray Diffraction Equipment to Determine Silica in Dust Exposures"—J. W. BALLARD, Ph.D., *U. S. Bureau of Mines, Pittsburgh Experiment Station*, Pittsburgh
12:00–12:15 General Discussion
12:15– 1:30 Luncheon and Exhibits

Thursday Afternoon, May 8

1:30– 1:45 "The Effects of the Inhalation of Dusts Encountered in the Chrome Brick Industry"—W. B. FULTON, M.D., and F. E. BUTTERS, *Division of Industrial Hygiene, Pennsylvania Department of Health*, Harrisburg, Pa.
1:50– 2:05 "Engineering Survey in Tri-State Lead and Zinc Mining District"—E. C. WARKENTIN, *Oklahoma State Department of Health, Division of Industrial Hygiene*, Oklahoma City, Okla.

2:10– 2:30 "Exposure to Silica Dust in Open Pit Mining Operation and Dust Conditions in Crushing Plant" —R. T. PRING, *Utah Copper Company*, Salt Lake City, Utah
2:30– 2:40 Discussion
2:40– 2:55 "Etiological Aspects of Particle Size in Quartz Dust"—B. D. TEBBENS, Sc.D. and R. SCHULTZ, *Harvard School of Public Health*, Boston, Mass.
3:00– 3:20 "Particle Sizes of Dust as Found in Various Industries and Determination of Silica in Bituminous Coal Dusts"—H. H. SCHRENK, Ph.D., *U. S. Bureau of Mines, Pittsburgh Experiment Station*, Pittsburgh
3:20– 3:30 Discussion
3:30– 3:45 "Animal and Petrographic Studies on Talc Dusts"—C. WILLIAMS, *Liberty Mutual Ins. Co.*, and R. SCHULTZ, *Harvard School of Public Health*, Boston, Mass.
3:50– 4:05 "Fuller's Earth as a Cause of Pneumoconiosis"—W. D. MCNALLY, M.D., *Consulting Toxicologist*, Chicago
4:10– 4:35 "Silicosis Among Naval Foundry Men"—E. W. BROWN, M.D., and W. E. KLEIN, M.D., *Medical Corps, U. S Navy*
4:35– 5:00 Discussion
5:00– 6:00 Exhibits

Thursday Evening, May 8

7:30– 8:00 "Review of Industrial Hygiene Progress During 1940"—WARREN A. COOK, *President, American Industrial Hygiene Association*
8:00– 8:15 "Claims of Industrial Poisoning"—P. N. HARGER, Ph.D., *Prof. of Biochemistry and Toxicology, University of Indiana, School of Medicine*, Indianapolis, Ind.
8:20– 8:35 "Medicine and Engineering Evaluation of Exposures in the Synthetic Sausage and Casing Industry using the Viscose Process"—M. H. KRONENBERG, M.D., *Division of Industrial Hygiene, Illinois Department of Health*, Chicago
8:40– 8:55 "Sampling and Determination of Aldehydes" —E. C. BARNES, *Industrial Hygiene Laboratory, Westinghouse Electric and Manufacturing Company*, East Pittsburgh, Pa.
9:00– 9:25 "The Absorption and Elimination of Noxious Vapors"—H. W. HAGGARD, M.D., *Director of Laboratory of Applied Physiology, Yale University*, New Haven, Conn.
9:25 Discussion

Friday Morning, May 9

8:30– 8:45 "Dermatitis Control in a Mass Production Industry"—T. F. MOONEY, *Ford Motor Co.*, Dearborn, Mich.
8:50– 9:05 "Sporotrichosis as an Occupational Disease Among Florists"—L. W. SPOLYAR, M.D., *Indiana State Board of Health, Industrial Hygiene Division*, Indianapolis, Ind.
9:10– 9:35 "A Statistical Approach in the Study of Hematologic Data from Some Common Solvent Exposures"—J. H. STERNER, M.D., *Eastman Kodak* Co., Rochester, N. Y.
9:40– 9:55 "Recovery Following Exposure to Benzol"— L. J. GOLDWATER, M.D., *New York University, Dept. of Preventive Medicine*, New York City.
9:55–10:10 Discussion
10:10–10:30 "Electric Arc Welding, Coated Rods"—C. P. MCCORD, M.D., S. F. MEEK, M.D., and G. C. HARROLD, Ph.D., *Industrial Hygiene Laboratories, Chrysler Corporation*, Detroit, Mich.
10:35–10:55 "Gases, Fumes and Vapors from Coated Welding Rods"—B. D. TEBBENS, Sc.D., and PHILIP DRINKER, *Harvard School of Public Health*, Boston, Mass.
10:55–11:05 Discussion
11:05–11:25 "Trends in Occupational Disease and Industrial Hygiene"—H. B. MELLER, Sc.D., and F. S. MALLETTE, *Air Hygiene Foundation, Mellon Institute*, Pittsburgh
11:30–11:50 "The Human Eye and Its Protection in Industry"—W. H. LEHMBERG, Sc.D., *American Optical Company*, Southbridge, Mass.
11:50–12:00 Discussion
12:00– 1:30 Exhibits

Friday Afternoon, May 9

ANNUAL MEETING, SECOND SESSION

1:30– 2:00 Election of Officers
2:00– 2:15 "Controlled Radium Hazards"—FREDERICK FLINN, Ph.D., *Columbia University*, New York City
2:20– 2:35 "Some Recent Observations on Phosphorus Toxicology"—R. B. L. FLEMING, *Tennessee Valley Authority*
2:40– 2:55 "Biochemistry of Carbon Bisulfide"—HOWARD MCKEE, M.D., *Harvard School of Public Health*, Boston, Mass.
2:55– 3:10 Discussion
3:15– 3:30 "Toxicity of 1-1 Dichlor-1-nitroethane" — WILLARD MACHLE, M.D., *Kettering Laboratory of Applied Physiology, University of Cincinnati*, Cincinnati, Ohio
3:35– 3:50 "Acute Toxic Effects Upon Experimental Animals of Methyl, Ethyl and Butyl Methacrylates" —WILHELM DEICHMANN, Ph.D., *Kettering Laboratory of Applied Physiology, University of Cincinnati*, Cincinnati, Ohio
3:55– 4:10 "Toxicity of Methyl Silicate"—W. G. FREDRICK, Ph.D., *Industrial Hygiene Bureau*, Detroit, Mich.
4:15– 4:30 Discussion
4:30–Business Meeting (Annual)

American Association
of Industrial Physicians and Surgeons

—Constitution and By-Law Amendments Proposed to be Voted upon at the Annual Meeting, May 5-9, 1941—

CONSTITUTION:

ARTICLE V, SECTION 3: After the words "twelve directors" in line 4, insert "and a House of Delegates consisting of the Officers and members of the Board of Directors and the Presidents or legally appointed or elected delegates of Component Societies." Delete that part of Section 3 beginning with "Presidents of Component Societies" and ending with "as other directors."

ARTICLE V: Change heading to read "Officers, Directors and Governing Bodies."

ARTICLE V, SECTION 1: After the words "Second Vice-President" insert "a Managing Director" and delete the word "Secretary" in the compound word "Secretary-Treasurer."

ARTICLE V, SECTION 4: Delete entire section which will be placed in the By-Laws.

ARTICLE V, SECTION 5 becomes Section 4, and change the word "five" to "six."

BY- LAWS:

ARTICLE I, SECTION 2: Change it to read "Special meeting of the membership may be called by the President with the approval of five members of the Board of Directors. Special meetings of the Board of Directors or of the House of Delegates may be called at the discretion of the President."

ARTICLE I, SECTION 3: Insert after the words "all meetings" the words "of the members" and delete the word "Treasurer" in the compound word "Secretary-Treasurer."

ARTICLE I, SECTION 4: Delete the word "Treasurer" in the compound word "Secretary-Treasurer."

ARTICLE IV: Change heading to "Duties of Officers and Governing Bodies."

ARTICLE IV, SECTION 1: "The planning of the work of the Association; arrangements for meetings and programs

and any or all other matters pertaining to the administration of the affairs of the Association shall originate in the House of Delegates but all its actions must be ratified by the Board of Directors."

ARTICLE IV, SECTION 2: "The Board of Directors shall have charge of the property and financial affairs of the Association and shall perform such duties as are prescribed by the Constitution and By-Laws and the State law governing directors of corporations. It must ratify the transactions of the House of Delegates, Committees and Boards before they can become effective."

All sections to be renumbered: Section 1 becoming Section 3, etc.

ARTICLE IV, SECTION 4: "The Managing Director shall be the executive officer of the Executive Committee and, under its supervision, during the intervals between meetings, shall manage, direct and conduct the affairs of the Association. He shall supervise and direct the activities of the Executive Secretary and shall render a report on the status of the Association to the Board of Directors at their Annual Meeting."

ARTICLE IV, SECTION 2 and 3: Delete the word "Secretary" in the Compound word "Secretary-Treasurer" and the last one in section 3 should be changed to "Managing Director."

Industrial Hygiene Problems

—*In the National Defense Program*—

C. D. SELBY, M. D., *Chairman,*
Subcommittee on Industrial Health and Medicine,
Health and Medical Committee

THE Council of National Defense, with the approval of the President, has designated the Federal Security Administrator as coordinator of all health, medical, welfare, and related defense activities. The Federal Security Administrator is authorized, with the approval of the President, to appoint such advisory committees and subcommittees as he may find necessary or desirable to assist him in his coordinating duties. The Subcommittee on Industrial Health and Medicine is one of such committees thus appointed, and it functions through the Health and Medical Committee as an adviser to the coordinator in industrial health and medical activities relating to the national defense.

The Federal Security Administrator has in his agency the U. S. Public Health Service, containing the Division of Industrial Hygiene of the National Institute of Health, which by virtue of 26 years of research and experience is in a strategic position to carry out many of the recommendations of the Subcommittee on Industrial Health and Medicine. Furthermore, this Division has the personnel, facilities, experience, and relationships with national, state, and volunteer agencies directly concerned or interested in the industrial health problems of national defense. In view of these qualifications, the Division of Industrial Hygiene of the National Institute of Health is considered to be the logical agency for leadership in achieving the defense objectives.

To facilitate this, Surgeon-General Parran has created a new Section in the Division of Industrial Hygiene of the National Institute of Health, with Mr. J. J. Bloomfield in charge. It will be concerned with all national defense activities and states' relations in industrial hygiene. Dr. Fred A. Neal will continue in charge of industrial hygiene research, which likewise has assumed great importance in the defense program.

Realizing that the responsibility for the protection of the health of our millions of workers lies finally with the states, the Division of Industrial Hygiene under the stimulus of funds made available under Title VI of the Social Security Act, organized and developed industrial hygiene services in 31 health departments. The work of these state units is so integrated with that of the Division of Industrial Hygiene that there now exists a nation-wide organization to serve effectively the workers in defense industries. Each of these state industrial hygiene units is already making industrial hygiene surveys and counseling management and physicians as rapidly as contracts are effected for the manufacture of defense materials.

THE Subcommittee on Industrial Health and Medicine recognizes the following pressing needs:

1. Expansions in personnel, facilities, and funds of state bureaus of industrial hygiene and the Division of Industrial Hygiene of the National Institute of Health to meet the needs of industrial hygiene in relation to national defense.

2. Surveys of arsenals and navy yards and training of industrial hygiene and medical personnel in these establishments.

3. Surveys of commercial shipyards, airplane plants, and manufacturers of military vehicles and munitions, and training of industrial hygiene and medical personnel as needed.

4. Promotion of first aid in (a) construction of isolated plants, and (b) in connection with disasters.

5. Toxicological researches on materials vital to national defense, notable among which are toluol, TNT, lead azide, and vinyl cyanide. Researches on these latter are already projected.

The Subcommittee appreciates the importance of environmental sanitation surrounding isolated industrial areas, but feels that this problem may best be handled by local health authorities, who are already in a position to act.

Beyond these pressing needs are others to which the Division of Industrial Hygiene is already committed. They were announced at the Conference of State and Territorial Health Officers called by the Surgeon-General on September 16, as follows:

1. The investigation and control of specific industrial hazards. Some of the industrial hazards to be investigated and controlled are: Exposure to dusts, fumes, gases, vapors, mists, defective illumination, ventilation, noise, excessive temperatures and humidities, abnormal pressures and posture.

2. Advice to industry and others on the location

Prepared by C. D. SELBY, M.D., Chairman, Subcommittee on Industrial Health and Medicine, Health and Medical Committee and presented at the Symposium on Industrial Public Health Nursing Services, February 21, 1941, Milwaukee, Wis., where it was read by E. C. HOLMBLAD, M.D., Secretary, Subcommittee on Industrial Health and Medicine.

of new plants and on the renovation of old plants, in the interest of safety and health.

3. The promotion of physical examinations and medical services by industry.

4. The preparation and dissemination of information on various toxic materials and processes, including approved designs of exhaust systems for the control and elimination of atmospheric contaminants.

5. The promotion of measures for the control of syphilis, tuberculosis and other communicable diseases among industrial workers.

REALIZING the great importance of the medical profession in these industrial hygiene activities in national defense, the Subcommittee on Industrial Health and Medicine met with the Council on Industrial Health, American Medical Association, in Chicago on January 12. There, a Joint Committee was appointed to make recommendations to the Health and Medical Committee. This Joint Committee reported as follows:

Many occupational hazards are involved in munitions and other defense work. The protection of workmen employed in such work is most important. Beyond that we are faced with the fact that the industrial workman in this country loses, on an average, a fraction over eight days a year from illness, much of it preventable. The rate for women is appreciably higher. This loss of time amounts to the staggering total of 340,000,000 days a year or considerably over 1,000,000 work years a year.

This burden confronts the defense program and has to be reckoned with in any production schedule. The joint committee urges that there be the fullest cooperation between all the medical agencies, official and non-official, as well as the technical and engineering skills concerned. The majority of American workmen are employed in small plants. It is most essential, therefore, to give the utmost attention to coordinating with the industrial health program, the medical profession upon whom falls the responsibility of caring for the worker, both inside and outside of industrial plants.

The recommendations which follow have for their object the preservation of the health of industrial workers employed in the various defense industries in so far as the administration of public health measures in the field of industrial health and hygiene is concerned.

To accomplish this task will require considerable expansion of present machinery. The immediate needs may be divided into four categories; (1) additional funds and personnel for the Division of Industrial Hygiene of the National Institute of Health, (2) additional funds and personnel for the state and local agencies in aiding industry, the medical and other essential professions in the prevention and control of industrial health hazards, (3) funds for the training of new personnel, and (4) funds for urgently required researches. The joint committee believes that the duties and functions prescribed by law and placing responsibility for health administration on various governmental agencies, state and Federal, should not be violated nor set aside. It is recommended that to the duly constituted authorities such aid be given as may be necessary to carry out the intent of the National Defense Program. In the extension of such medical services as the emergency may dictate the principle of the utmost utilization of qualified medical and hospital facilities already established, should be scrupulously preserved.

The cost of this program as defined in Subheads A and B, and exclusive of Subhead C, will be per annum, $1,650,000.

A. Properly trained personnel is necessary to provide health and protective measures in plants engaged in defense work. It is essential to train physicians and engineers both in the army and navy and U.S. Public Health Service, and other official agencies in the fundamentals of industrial hygiene.

This can be accomplished:

1. By forming training courses, for which a minimum of three months is deemed necessary, to be carried on in designated locations throughout the country. Training centers under the jurisdiction of university schools should be selected, and such aid be given these schools as may be necessary in setting up their courses. This program should be administered by the U.S. Public Health Service. It is estimated that the immediate needs of the U.S. Public Health Service, the army, the navy, and the several states will require 300 physicians, engineers, and other technical personnel. *The cost of this portion of the program will be* $500,000.

2. By conducting, where indicated, intensive training courses in industrial health and hygiene in governmental plants by mobile groups of properly trained technicians, both medical and engineering. This phase of the training program should be administered by the U.S. Public Health Service, either directly or through state bureaus of industrial hygiene, or state departments of health.

3. There are and will be a large number of small establishments working on defense and related industrial projects, either directly or through sub-contracts, where employees do not receive adequate health protection. It is a function of state bureaus of industrial hygiene to survey such industries and make specific recommendations for the protection of employees. This activity should also be devolped under the leadership of the U.S. Public Health Service. This Service should set the minimum requirements of health protection within these plants for the guidance of state divisions of industrial hygiene and/or state departments of health. The Division of Industrial Hygiene of the National Institute of Health should develop in cooperation with the state health authorities, and the committees on industrial health of the state medical societies, a definite program of instruction, designed to acquaint the practicing medical profession with the fundamentals of industrial medicine; and designed to

carry into effect the minimum standards set up to protect the health of employees.

4. In carrying out the work referred to in Items 2 and 3, the Research Section of the Division of Industrial Hygiene will be required to assemble rapidly information necessary for the detection, prevention, and treatment of conditions due to chemical and physical agents and other environmental factors. This will necessitate an increase in the research work of the Industrial Hygiene Division. *The cost of the activities above defined in Items* 2, 3, *and* 4 *is* $1,000,000.

B. Certain researches are needed to complete the industrial hygiene aspects of the National Defense Program. These are:

1. Research into harmful properties of many substances which have lately come into use in munitions manufacture and about which little is known. *Funds in the amount of* $150,000 *should be made available to the Health and Medical Committee, Federal Security Agency, for them to allocate as they may deem necessary.*

C. Various defense industries are being organized and located in isolated sections. These plants will each employ some thousands of workers, who, with their families, will form an industrial community rapidly developed and settled where the accepted provisions of public health are not available. It will be necessary to provide for these communities, adequate: (1) water supply, (2) sewage disposal, (3) milk supply, and (4) food supply. The public health activities are the function and responsibility of the boards of health in the states where these industries may be located. These funds are not included in the estimate previously given. The joint committee assumes that this aspect of the situation will be cared for by the proper agencies.

This report of the Joint Committee has been translated to Dr. Irvin Abell, Chairman of the Health and Medical Committee, Federal Security Agency, for consideration by the Committee and such action as it may deem advisable and necessary. If it is approved and funds made available, the official Federal and state organizations will be in an excellent position to proceed, not only in meeting urgent needs, but in forwarding the permanent industrial hygiene program which has been gradually expanding during the past 27 years.

AS YOU doubtless noted, Item A-3 in the report of the Joint Committee recognizes the importance of the practicing medical profession. It places in your agencies the responsibility of developing in cooperation with the committees on industrial health of the state medical societies, a definite program of instruction designed to acquaint the practicing medical profession with the fundamentals of industrial medicine. Dr. Spolyar in Indiana has already initiated a move in this direction. In Wisconsin, the State Medical Society is taking the initiative. It is hoped that this effort to acquaint the general medical profession with its opportunities for service in the field of industrial health and industrial medicine will be nation wide.

The Subcommittee on Industrial Health and Medicine is exploring the other medical fields which are related to the health of industrial workers. It meets in a joint session with the Committee on Neuropsychiatry of the National Research Council, on February 19, to discuss a program of applied psychiatry in the national defense industries. Dr. George M. Smith, a member of the Subcommittee on Industrial Health and Medicine, is acquainting himself with the latest in the field of nutrition as applied to industrial workers, preparatory to a joint meeting with the Subcommittee on Industrial Nutrition of the National Research Council.

In the foregoing I have endeavored to give you a general statement covering progress since the creation of the Subcommittee on Industrial Health and Medicine, which progress by comparison with the industrial hygiene program of the World War, is something of which we may well be proud.

Compensation Problems

Review by

C. O. SAPPINGTON, M.D., DR. P.H.,
Consulting Industrial Hygienist,
Chicago

PROBLEMS OF WORKMEN'S COMPENSATION ADMINISTRATION in the UNITED STATES AND CANADA. MARSHALL DAWSON. Bulletin No. 672, U. S. Dept. of Labor, Bureau of Labor Statistics. (1940) pp. 229.

IT IS one thing to pass a law—it is another to properly administer it. Furthermore, the administration can be no better than the energy, ability and knowledge of the administrators. Hence, the innumerable problems encountered in the administration of workmen's compensation laws, both in the United States and Canada.

This comprehensive analysis of the methods of administration of compensation laws includes a considerable of such subjects as Scope and Method of Survey; Experience under Different Types of Laws; Persons and Employments Covered; Injuries and Diseases Covered; Adequacy of Benefit Payments; Medical Aid; Claims Administration; Allied Services of Workmen's Compensation Administration; Methods of Financing Workmen's Compensation Administrations and Funds; Cooperation of Workmen's Compensation Administrations with Rehabilitation Agencies.

Three valuable appendices are included, one on experience with silicosis under Wisconsin Workmen's Compensation Act, 1920 to 1936; another on principal features of workmen's compensation laws as of July 1, 1940; and the third, a reading and reference list.

The purpose of the survey has been to throw light on the conditions under which the best results could be obtained from a given type of legal provision or administration. The basic principle involved is prompt protection for injured workers, which has found almost universal acceptance throughout the country. There are, however, greatly varying types of coverage, exemptions, insurance requirements, compensation, medical benefits, methods of computing the compensation wage base, and many other items of difference.

"The vast amount of existing uncoordinated information on workmen's compensation, obsolete at some points and with gaps at others, is bewildering to students and administrators. The method of presentation in this re-

port is designed to aid the reader in securing an outline of the situation and a grasp of principles which relate to details of administration to the compensation program as a whole. The best possible method of presenting in brief space the varied features of law and administration is by analysis, summary, and illustration by selected examples of situations and practices. Because of continual changes in the law and administration, recourse should be had, for current information on specific details in the benefit systems, to the latest periodicals, tabulations, bulletins, and law digests. So far as possible, this survey report avoids duplicating the material that is to be found in the current publications of the Department of Labor. Summaries of factual data are used primarily to outline the major features of the compensation system and to illustrate important principles and programs, rather than to furnish exhaustive information on the subject in hand. Otherwise, much of the report would soon become obsolete."

The complicated problems with respect to administration of workmen's compensation are so many and varied that it is impossible in this review to even list such problems. It is only possible to point out a few of the outstanding controversial items.

WITH reference to the so-called legalistic approach, in which decisions are referred to courts for interpretation, it is apparent that there is much confusion. "The alternatives presented were, on the one hand, to guard against ill-considered awards and excessive costs by legal technicalities, court interpretation, and litigation, or, on the other hand, to make a broad and relatively simple provision for the protection of injured workers, and place the dependence for prompt and just awards upon competent administration."

In another portion of the survey, referring to the same subject, E. H. Downey is quoted as saying: "the grounds for allowing an appeal from the administrative board to a court are rather a matter of constitutional fetichism than of reasoned policy." It is admitted in the report, however, that it would "be unwise to remove the restraint of judicial review unless we could build up a personnel with an independence and tenure comparable to that of the courts." The most striking statement, however, is found on page 131 of the report, as follows: "But it is apparent that the judicial review of a small percentage of the cases handled by a compensation board is not a satisfactory remedy for an undesirable personnel situation. *In the present survey no instance has been found where the deficiency of an administration has been made good by advantages derived from the court review of decisions.*" (Italics are ours).

A subject of more than usual interest has always been the cost of general coverage as compared with the cost of blanket coverage. "Various estimates by private insurance carriers and employers' associations relating to the cost of extending the range of coverage have necessarily been based mainly upon past experience. Where the result of such experience has not been available in scientifically organized form, the dependence has been upon conjecture or analogy. The estimates of the cost of occupational-disease coverage that have been presented to legislatures have therfore ranged from bona fide actuarial computations to broad guesses." It is the opinion of the reviewer that "broad guesses" are still being used to a large extent, because there has not yet been sufficient experience with occupational diseases with reference to compensation administration, on which to actually base real actuarial computations. It is certain that most insurance companies do not create sufficient "reserve" to allow proper scientific investigations of claims.

IN THE discussion of medical aid, the problems of choice of physician, medical examination of workers as a preventive procedure, importance of adequate provision for medical supervision, and attitudes of insurance carriers are important subjects. "The carriers which have superior medical supervision, based upon high standards of performance and ethics, naturally look upon this superiority as one of their competitive advantages over other carriers, to be stressed when presenting their service features to employers who are interested in securing fair and competent attention both to the injuries and claims of workers. On the other hand, until more uniformly fair medicolegal service is rendered by all insurers, the report of unfairness at the hands of any carrier causes workers to look upon insurance adjusters and doctors with suspicion, and at times to be noncooperative in the curative program. The element of suspicion has consequently become a factor in the medical care of workers, and is a recognized and costly source of neurosis and delayed recovery. In the absence of legislation imposing upon carriers minimum standards as to organization for service to injured workers, the solution of this problem awaits, in part, the realization by compensation-insurance carriers that they have common interests in the supervision of the medical phase of the compensation system. But in the absence of cooperative action for maintaining standards of service and practice, attention may be directed to the example of those insurance carriers which, instead of making their medical supervision a subordinate feature of the claims department, have set up their medical department as a scientifically minded agency for supervision, research, and preventive activity, and which give both pre-employment and continuation training to their claims examiners."

MEDICAL controversies are still regarded as a major problem: "The most serious and common defect in the conduct of compensation hearings in the states arises from the toleration of prolonged medical controversies. Many compensation officers do not know the best method of handling, or preferably stopping, public medical controversies over the condition of injured workmen in the presence of the unfortunate victims of industrial accidents. If some injured workers are not already 'shell-shocked' or neurotic before they attend a hearing and listen to the medical testimony, they are indeed hardy and nonsuggestible if they leave the hearings in other than a hopeless state of mind. It is a common occurrence for medical witnesses, in order to obtain a maximum disability rating for the worker, to testify loudly and emphatically that the injured man will never be able to resume his accustomed occupation, that he is seriously and permanently disabled, that his condition will get worse instead of better, and as an occasional climax that the worker may die soon. Such a practice in connection with hearings has long been recognized as highly detrimental to the worker and sometimes responsible for irreparable harm. But in spite of its condemnation the abuse is widely prevalent in the states." The reviewer can heartily subscribe to the picture herein painted, as he has observed it many times.

Some of the most valuable material in the report is to be found in the appendices. The experience of silicosis under the Wisconsin Workmen's Compensation Act from 1920 to 1936 provides statistics which probably cannot be secured elsewhere, particularly with reference to distribution of cases by industry, by occupation, by employment status when filing claim, and cost of silicosis cases, both alone and when compared to other injuries.

An analysis of the principle features of workmen's compensation laws as of July 1, 1940 by Mr. Charles F. Sharkey of the U. S. Bureau of Labor Statistics in Appendix 2 is of particular value to those who are seeking a summary of this subject.

It is evident from this report that the existing compensation system is an incomplete structure and that there are still many problems to be solved, such as: relative disadvantages and advantages of exclusive and competitive state funds; the cost of various types of occupational disease provisions; results of experience with wage base for compensation purposes; the extent of actual coverage of injured workers; the extent of compensation offsetting wage loss.

This is a most valuable compilation for anyone who is interested in any phase of workmen's compensation.

Industrial Medicine
Reg. U. S. Pat. Off.

The Journal of Traumatic Surgery and Occupational Diseases

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No Charge

THE announcement, on the opposite page, regarding the establishment of a Registration Bureau to serve physicians and surgeons, industrial hygienists and nurses, together with the industries, large and small, which—under the impetus of the national defense program superimposed upon improving business conditions —are going to need their abilities, has a number of important significances.

First is the fact that it will function as one of the services of the AMERICAN CONFERENCE ON INDUSTRIAL HEALTH (as to the purposes and personnel of which see page 10) in conjunction with the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS (as to which see page 4).

Second, it will function *without charge,* either as to registration or placement. In this respect the words "without charge" mean just what they say; they have no undisclosed connotations of any character; they are intended to preclude all kinds of payments, so that there will not be even a request for as much as "a dime to cover postage."

And third, and as a resultant of the first and second, this Registration Bureau is where it ought to be, and its service is being undertaken by and under the direction of those who are best qualified in all the matters and things necessary to assure its maximum usefulness. It is directed by men who are thoroughly grounded not only in the "practice" but also in the "practical" of industrial medicine; men who are skilled in the adaptations which the "industrial" part of industrial medicine requires, and who are accustomed to making such adaptations without conflict between theory on the one hand and exigency on the other, and with a result that dignifies both. In other words, these men understand, as do all medical men who have an adequate industrial background, the needs of the small concern as well as the large, while recognizing fully that the one may have many limitations where the other has few or none.

It is, therefore, urged that this announcement be read and remembered. Inquiries may be sent to INDUSTRIAL MEDICINE or to the Executive Secretary of the AMERICAN CONFERENCE ON INDUSTRIAL HEALTH at the address given on page 10.

Multum in Parvo

CONTINUING as to the above-mentioned announcement, and regarding the already evident shortage in professional personnel in industrial medical work, we believe that one result of the present demand will be such an enhancement of the general reputation of industrial medicine as will not only lay forever the ghosts of the past which still haunt certain elements of the profession, but will also make those who are now more or less reluctant to admit their qualifications and status, proud of both. This is apropos of the sentences quoted by DR. SAPPINGTON (on page 102):

"Moreover, a second questionnaire was sent to 3,544 persons who indicated special competence in industrial medicine. At once 495 replied to the effect that they were not industrial physicians. Only 1,283 physicians especially qualified in industrial medicine could be recorded as actually competent in the field."

The quotation does not include, nor does the quoted matter express, the obvious fact that there *are* more but they won't admit it.

As to exactly how many more there are, the medical subscription list of INDUSTRIAL MEDICINE includes a larger number of industrial physicians and surgeons than the sum of all three of the foregoing figures. But more significant is the membership of the A.A.I.P. & S., which, with the new component societies listed on page 9 — in New England, California, Hawaii, Maryland, and Florida — now exceeds the "recorded" figure of 1,283. These members are all competent, all qualified, and they do not hesitate to acknowledge the fact that they are *industrial* physicians and surgeons.

The ASSOCIATION welcomes the new members. Their elected representatives will participate in its councils, and be heard in its deliberations. The future holds much of importance, in which they will be helpful.

In whatever is thus involved they will carry on the ASSOCIATION'S fine traditions of the past, which now is more than a quarter-century long in both traditions and achievements.

INDUSTRIAL HEALTH AND DISEASE

Pre-Employment Examinations

ROSS TRIGG, M.D.,
Fort Worth, Texas

IN 1861 Horace Dobell of London advocated as a custom periodical examinations for all persons and their children, but when and where the practice of pre-employment examinations originated, I do not know. However, this practice probably was first instituted by the railroads for the purpose of selecting only those physically fit for certain railroad duties.

As a rule the physical requirements of examination for railroad employment were not too strict and in many instances were worse than useless because of the manner in which they were conducted. I learned from a booklet published by Wm. G. McAdoo, National Railroad Administrator during the World War, that many of the leading eastern lines required examinations only for vision, color perception, and hearing, and such examinations were made by yard masters, round house and section foremen. Once I witnessed the examination of an applicant for railroad employment which was made by a local surgeon in a nearby Texas town. After an examination for an inguinal hernia and blood pressure, he certified the applicant as physically fit.

While an intern in a Fort Worth hospital, I overheard a fellow inmate consoling a switchman who had lost a foot and would never be able to follow his occupation again. The switchman replied, "That won't make any difference, I will get by the examination all right. The doctor will pull down my pants and examine me for a rupture, and he will never know that I have lost a foot." Not so long ago in another Texas town, a medical examiner qualified a negro applicant without detecting an artificial foot and leg. I once asked a young friend what his father was doing and he replied, "Well, his eyesight got so bad he could not hold down a job at the laundry, and he is working now as flagman for the railroad company."

Since the relationship of occupation, disease and injury is now a most important national medical and legal problem, pre-employment medical examination is almost a necessity and is compulsory in North Carolina and optional in Wisconsin. The purpose of such examinations varies somewhat. In some instances the reasons are purely selfish and perhaps justified protective defense measures of the employer against claims of disability by the scheming and dishonest employee with some pre-existing, non-disabling defects or the employee with some disease, the symptoms of which are so often sympathetically classified by our colleagues, industrial commissions, and courts as the effect of some injury fancied, minor or otherwise. Recently a negro was referred to our office for treatment for an external thrombotic hemorrhoid. We advised the patient and his employer that the condition was not traumatic or compensable. The hemorrhoid was incised. Later the patient alleged that the sphincter had been cut and he received a verdict from the district court for total permanent disability.

Public carriers such as railroads and bus companies cannot be too careful in the selection of those who are employed and entrusted with the duties of the safe transportation of the public. Defective vision and hearing, loss of color perception and constitutional diseases which predispose to sudden death should disqualify all who apply for such positions, and pre-employment examination is the only method of detecting those unsuitable for this responsibility. Often pre-employment examinations will expose applicants who are physically unable to work without danger to themselves or to fellow employees; those who are carriers of infectious or contagious diseases easily transmitted; and others who have disqualifying phys-

Important Announcement
- Registration Bureau -

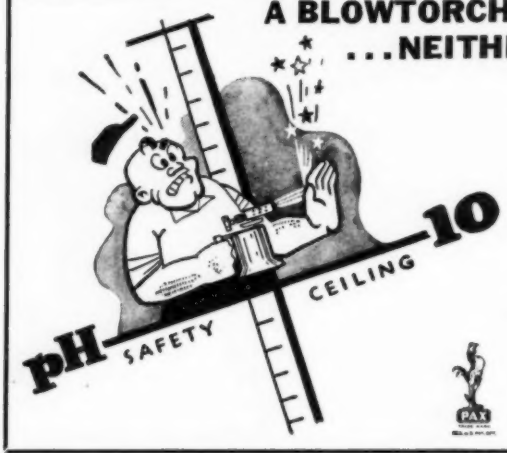
IT IS becoming increasingly evident that there will be a very definite shortage of professional personnel in industry, even when only the partial effects of the defense program have been experienced in American industry. This shortage of professional personnel especially applies to industrial physicians and surgeons, industrial hygienists, and industrial nurses.

If present demands are properly interpreted, such professional shortage will be felt particularly in industries which are not considered especially essential to the defense program and is also quite likely to be felt even among the defense industries, because of the great demand for such persons in the military service.

Contemplating, therefore, the meeting of this problem and the building up of a strong reserve of professional people who may be or have been working in or with industrial groups, the AMERICAN CONFERENCE ON INDUSTRIAL HEALTH and the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS are now organizing a Registration Bureau primarily for the purpose of putting on record, and making available for concerns needing their services, the qualifications, experience, and readiness of industrial physicians, surgeons, hygienists and nurses. Forms are in process of preparation and mailing to these groups throughout the United States, with the purpose of preparing information which will be available to industries throughout the country, as such knowledge may be needed.

The Registration Bureau will function as one of the services of the AMERICAN CONFERENCE ON INDUSTRIAL HEALTH and the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS which later will be made available through proper industrial channels, by direct affiliation with agencies representing industrial groups.

There will be no charge for registration nor for placement, it being considered that this is one of the services which should be rendered by these organizations, especially in times of emergency, in order that those industries which find themselves in need may be assisted in providing proper and adequate professional services, for the maintenance of employee health.



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ical defects, thereby effecting a saving to industry in compensation rates and claims.

Nearly all railroads have employees' hospital associations and in some industries, sick and health or welfare associations have been created and financed by mutual employee assessments. Under such arrangements it is desirable that no one be employed who may, because of unsuspected disease, become a financial burden to such an organization. Diabetes, peptic ulcer, heart disease, hypertension, varicose veins, chronic leg ulcers, phlebitis, tuberculosis, syphilis, or neurasthenia are examples of such chronic diseases. The cost of such employees through sickness, loss of time, and inefficiency may be staggering.

If time permitted, I could present case histories of compensation claims that have been made for the following diseases: brain tumors, cancer, headaches, pneumonia, apoplexy, epilepsy, cerebral softening, dizziness and headaches, otitis media, insanity, deafness, ruptured ear drums, cataract, persistent unilateral dilation of a pupil, iritis, conjunctivitis, corneal ulcers, trachoma, defective vision, tuberculosis, pleurisy, bronchiectasis, bronchitis, spontaneous pneumothorax, pleural effusion, pneumonoconiosis, herpes zoster, myocarditis, coronary thrombosis, coronary occlusion, hypertension, rupture, prostatitis, appendicitis, floating kidney, Bright's disease, varicose veins, phlebitis, chronic leg ulcers, neuritis, inguinal adenitis, ingrowing toe nails, bunions, corns, orchitis, epididymitis, varicocele, hydrocele, internal and external hemorrhoids, external thrombotic hemorrhoid, anal fissure, rectal hemorrhage, tumors of testicle and cord, back pains, spinal arthritis, spinal curvature, spinal anomalies, pruritis ani, loss of manhood, typhoid fever, typhus fever, malta fever, barber's

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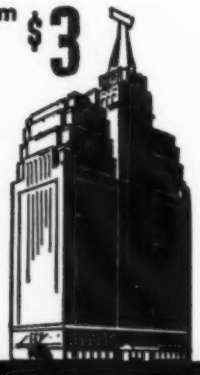

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itch, dermatitis, occupational diseases, eczema.

Alas, I have learned from bitter experience the ghastly effects of a strain upon the human system. Why was I not taught in college that a strain is the chief etiological factor in the production of the conditions enumerated above? Why should I have been chagrined and embarrassed by the scorn of claimants and lawyers, and why should my ignorance have been exposed and my integrity questioned in court? It was because I did not possess this knowledge. Our schools and authors must hasten to revise their teachings and books. Strains must be given the responsibility for all pain and disability suffered by the human body.

No matter how thorough the examination might be, a dishonest employee will find a loop hole. Certain physical defects *per se* are non-disabling and when present, they should be accurately described and recorded in the report and the applicant may be qualified where qualification in such cases is discretionary with the examiner. The pitiful consequences of the disqualification of an applicant who has a family, and who seeks an opportunity for work after several years of unemployment, may influence the examiner to be too lenient. Subsequent claims of serious proportions based upon trifling pre-existing defects have many times made me regret this weakness. A short time ago a negro was sent to our office for pre-employment examination. We discovered the total loss of vision of the left eye due to a cataract which the negro said was of long standing. This was recorded in our report, and he was qualified, but after his discharge a few months later, he was awarded compensation in a district court for total loss of vision of one eye, on his claim that the loss of vision was due to an injury. I once qualified a friend who had a very slight congenital umbilical hernia, and to my disgust he soon claimed disability because of alleged pain in the hernia. Such cases could be recited by the day.

If we were strictly required to qualify only applicants who are unquestionably physically fit probably 40% of those whom we now qualify would fail to pass the examination, and consequently many worthy men would be denied the opportunity of engaging in a gainful occupation.

The more complete the examination the better, but local industry cannot always afford Wassermann tests, blood examinations and x-rays. These tests are desirable and should be the routine when the company conducts a hospital with a full time staff. At present much confusion and harm comes from our varied conception of the significance of diseased tonsils, pyorrhea, dental caries, defective hearing and vision, eye diseases, varicocele, hydrocele, varicose veins, blood pressure, weight and hernias.

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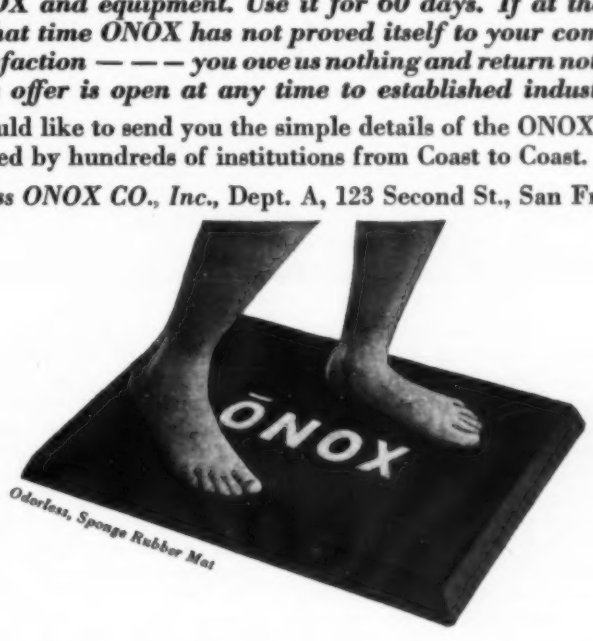

Applicants with hernia should be disqualified, but doctors often disagree as to whether a person has or has not a hernia. Usually the disagreement results in a difference of the conception of a hernia, and this is a problem which should be settled as quickly as possible. It can be done, and this section should initiate the movement for the appointment of a committee by the American Medical Association to study and define hernias, and its recommendations should be nationally adopted as a standard guide for industrial surgeons, commissions, and courts.

The examiner is the "goat" when an applicant is disqualified. The applicant holds him responsible for losing his job and the ill will of a large number of disqualified applicants is costly to the doctor. It is costly to the doctor when an employee whom he has qualified causes his company trouble. The examiner is blamed for that, too, and he should be if his examination has been careless or hasty, for such examinations are worse than none at all.

This paper is presented in the hope that those interested in industrial health will realize that only through the proper selection of employees and the establishment of sanitary and hygienic working environments can the objectives of industrial medicine be realized.

Abstract of Discussion:

DR. CARL A. NAU, Austin: In this country the value of physical examinations does not seem to be questioned very often. Naturally, the findings are to be used to properly

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place men in work for which they are fit. Actually, the findings are often used to keep men from jobs and because of such results, organized labor in general in Texas opposes such examinations.

North Carolina has required physical examinations, including a flat roentgen plate of the chest, of every employee in a dusty trade for the past three years.

In Wisconsin, physicians, employers, and employees have recently agreed upon a plan of examination for all workers. The cost of such examination is paid by industry. The examination is conducted by any physician industry chooses. Employee and employer are given a report of major abnormalities and defects.

The English and Australians do not accept pre-employment examinations as good practice. They believe every man has a right to a job. If he suffers while employed, industry must pay and can in turn add the cost to the price of the commodity. It appears that the choice lies in which way we want to spend our dollar. In either case, the consumer pays.

"Hollow Foot" in Industry

HERMAN H. HUBER, M.D.,
Milwaukee

IN THE practice of industrial surgery, the very frequent injuries of the ankle and foot are encountered. Among these, one is struck at times by the finding of a high arched foot, or as it is known a "hollow foot." Pes cavus may occur as an inherited pecularity; or it may be acquired through the wearing of high shoes and the habitual disuse of dorsiflexion, or by dancers through the excessive use of the calf muscles. It may have a neurological origin, or it may be due to trauma. The present paper will deal exclusively with the latter problem. A few years ago the author was very much impressed with a case which was referred to him for examination and observation. As the nature of injury is important, a rather complete history is being submitted.

From the Department of Traumatic Surgery, Mt. Sinai Hospital. Published in *The Wisconsin Medical Journal*, January, 1941.

Case History

ON February 18, 1934, the patient, aged 43 years, white, was wheeling a truck. The man ahead of him who was doing similar work, dropped a sack of flour, the claimant had to stop suddenly and the man in back wheeled the truck over the patient's right foot, the toes of which were pressed forward and the heel slightly raised. He was sent to the Emergency Hospital where he remained a few hours. The following day he was sent to a doctor and then referred for x-ray study of the foot. The x-ray examination was negative for bone injury. The patient saw the doctor every other day and received infra-red therapy. Four weeks after the accident he was dismissed as cured and advised to return to work.

I examined the patient on March 27. At that time he complained of pain in his right foot and inability to bear weight on it. On examination I found the following: The patient wore an unlaced shoe, he walked with a bad limp, on the heel and the lateral border of the foot, placing them simultaneously on the ground. The foot was cyanotic and swollen; pronounced tenderness was found over the extensor and the plantar surfaces of the foot near the tarsometatarsal articulation; the architecture of the foot appeared to be disturbed as if contracted; the toes were extended at the proximal joints and flexed at the interphalangeal joints. The right foot was one-half inch shorter than the left, the height of the right arch was one-fourth inch higher than the left; indurated calluses were found over the center of the heel and under the heads of meta-

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tarsal bones. Tenderness was elicited over the scaphoid-inner cuneiform articulation. In walking, the foot appeared to be turning in a "varus" position in which the forepart is pronated, adducted, and flexed. The motions at the ankle joint were resisted because of pain. A diagnosis of a traumatic pes cavus was made (the opposite uninjured foot was normal in all respects) and the patient was referred back to his insurance company with the explanation that he needed further medical care and intensive physiotherapy. After three weeks the patient was dismissed as cured.

I saw him again on June 5. There was very slight change in his condition and almost complete ankylosis at the ankle joint. I referred the patient to the occupational therapy department of the Mt. Sinai Hospital where physiotherapy and manual manipulation were instituted. The shrunken plantar tissues and the contracted tendons were stretched daily. Manipulation of the foot was followed by massage. After eight weeks of this intensive treatment, a great improvement took place and the patient was able to return to work on August 18. The motions at the ankle joint gradually returned to better than one-half normal range and his gait improved sufficiently so that he placed his foot well on the ground.

Discussion

IN the above case, in which the x-ray films were entirely negative, there was apparently a sufficiently severe contusion of the foot to bring about hypertonicity of the intrinsic foot muscles which eventually became spastic and shortened, and a simultaneous hypotonicity of the calf muscles further aggravated the condition. This case caused the writer to gain a wholesome respect for injuries to the foot, and especially those in which compression of the foot has taken place, for it is in these latter cases, where the injury causes compression of the foot from before backward, that the foot is forcibly bent in the midtarsal articulation, the longitudinal arch is heightened, and the intrinsic muscles injured. However, it can be seen that even a sprain of an ankle or injury to the metatarsal bones or phalanges may produce similar results. In cases of compression or severe contusion of the foot, the rationale of the treatment is that walking is completely prohibited. No weight bearing is allowed and the foot is encased in a proper cast, with an arch support incorporated in it, if necessary. After about four weeks, the cast is removed and physiotherapy is instituted. A similar procedure is pursued in cases of severe sprain of ankles or of injuries to the metatarsals or the phalanges of the large toe if the inability to bear weight supervenes within a few days after the injury.

Summary

PREVENTION of traumatic pes cavus is of paramount importance, and the simple measures suggested above should be instituted early. If the "hollow foot" has occurred, conservative treatment should be tried, however tedious it may be. Forcible manipulative treatment under anesthesia or operative lengthening of tendons should be done only if all conservative measures have failed after a prolonged trial.

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New England Health Institute

— *Sessions on Occupational Hygiene*

THE Eleventh New England Health Institute, to be held at Hotel Statler, Boston, April 2, 3, and 4, 1941, will include two sessions on Occupational Hygiene:

Thursday—April 3:

PHILIP DRINKER, S.B., Ch.E., *Chairman.* Professor of Industrial Hygiene, Harvard School of Public Health.

9:30 (a) Prefatory Remarks. W. IRVING CLARK, M.D., Director of Personnel, Norton Company, Worcester, Mass.; Chairman, Committee on Industrial Health, Mass. Medical Society. (b) National Measures for the Advancement of Industrial Medical Service, ANTHONY J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.; Member, Council on Industrial Health, American Medical Association; Committee on Industrial Medicine, U. S. Council of National Defense.

10:30 The Works Physician's Place in National Defense—FREDERIC N. MANLEY, M.D., Plant Surgeon, Bethlehem Steel Company, Shipbuilding Division, Quincy, Mass.

11:30 Absorption and Excretion of Volatile Solvents—HOWARD W. HAGGARD, M.D., Director, Laboratory of Applied Physology, Yale University.

Friday—April 4:

PHILIP DRINKER, S.B., Ch.E., *Chairman.*

2:00 Industrial Noise Quieting — L. S. AYARS, JR., A.B., Eastern District Manager, Acoustical Department, The Celotex Corporation, New York, N. Y.

3:00 Symposium: Occupational Disease Prevention Methods. Personnel of New England State Agencies:

Connecticut: Bureau of Occupational Diseases, State Health Department, Hartford: ALBERT S. GRAY, M.D., Director; ALLAN L. COLEMAN, B.S., Chief Industrial Hygienist; BENJAMIN F. POSTMAN, M.E., Industrial Hygiene Engineer.

Massachusetts: Division of Occupational Hygiene Department of Labor and Industries, Boston, Mass.; MANFRED BOWDITCH, A.B., Director; HERVEY B. ELKINS, Ph.D., Chemist; W. C. L. HEMEON, S.M., Engineer; SHERMAN S. PINTO, M.D., Physician.

New Hampshire: Division of Chemistry and Sanitation, State Board of Health, Concord; FREDERICK J. VINTINNER, S.B., Industrial Hygienist, Industrial Hygiene Unit, State Board of Health, Concord; ELMER P. WHEELER, S.B., Chemical Engineer; FORREST H. BUMFORD, S.B., Ventilating Engineer.

Rhode Island: State Department of Health, Providence: JAMES P. DERREY, M.D., Medical Director, Industry Hygiene Unit; CHARLES LUNDY POOL, M.S., Chief, Division of Sanitary Engineering; JOSEPH WURAFTIC, M.S., Engineer in Charge, Industrial Sanitation Sec.

Vermont: State Department of Health: HAROLD W. SLOCUM, A.B., Director, Division of Tuberculosis and Industrial Hygiene, Burlington; ROBERT B. AIKEN, M.D., Physician, Division of Tuberculosis and Industrial Hygiene, Barre.

—Continued from Page 10.

prepared for the Symposium on Industrial Public Health Nursing Services held at Milwaukee, Wisconsin, last month, and was read there by Dr. E. C. HOLMBLAD, Secretary of the Subcommittee on Industrial Health and Medicine. THE Book Review, by DR. SAPPINGTON, summarizes Dawson's "Problems of Workmen's Compensation Administration in the United States and Canada." The reviewer finds "there are still many problems to be solved. . . . " THE editorials (page 122) comment upon (1) the significance of the "Important Announcement — Registration Bureau" which appears on page 123, and (2) the continuing expansion of the A. A. I. P. & S. by way of growth in both activities and membership. DR. Ross TRIGG's "Pre-Employment Examinations" (page 123) speaks frankly regarding certain matters which, no doubt, have often caused many industrial physicians much concern. The list of things he gives as the reasons for compensation claims is nearly all-inclusive. Little is missing, but syphilis — which, thus far seems not to have been seriously urged as an occupational disease. But who shall say that it won't be so urged? In a recent very high-brow review of Hemingway's new book "For Whom the Bell Tolls" the reviewer refers to syphilis as the *occupational disease* of bull fighters.

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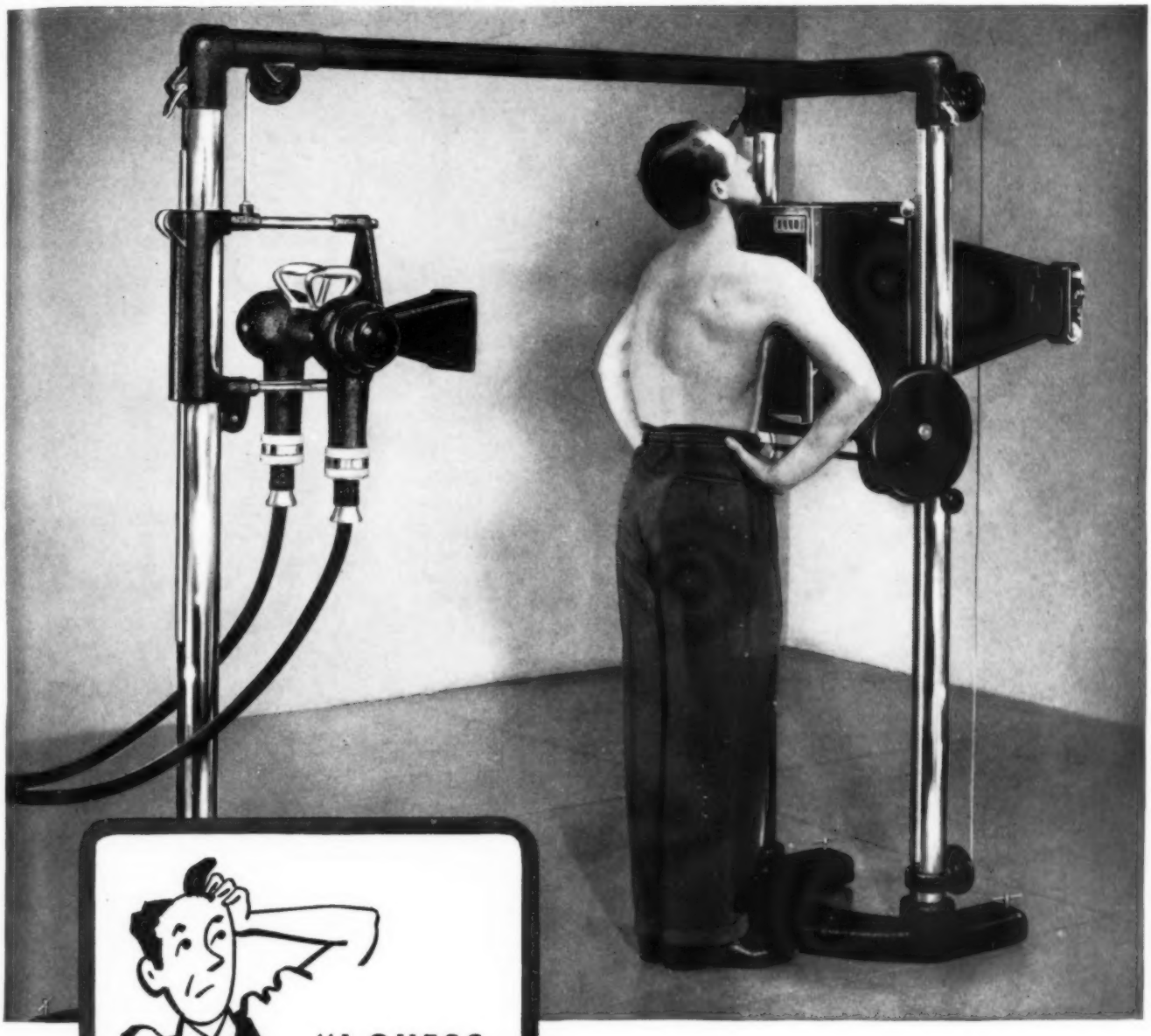

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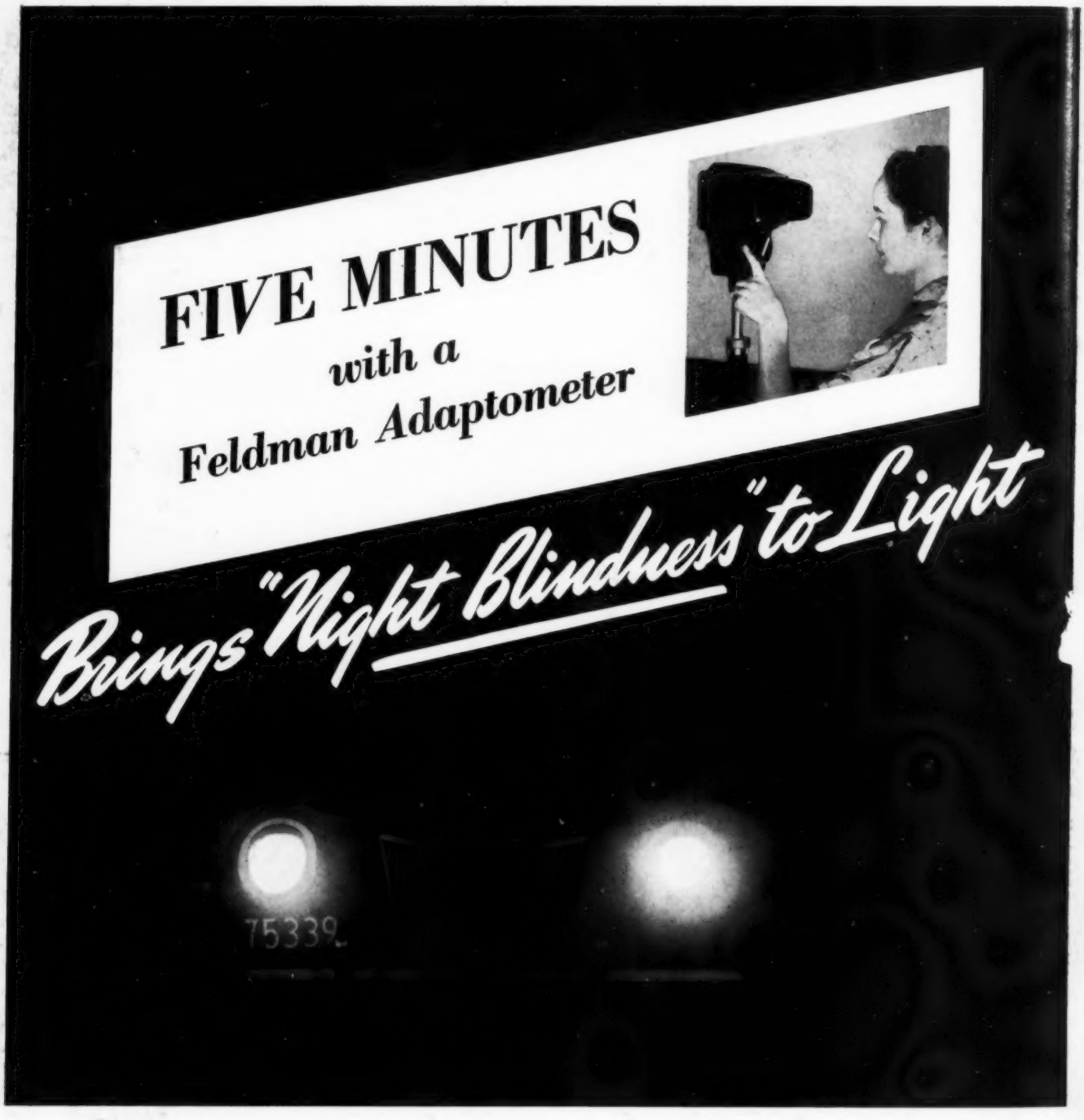

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